School of Civil and Environmental Engineering

February 17, 2014

On behalf of the School of Civil & Environmental Engineering Awards Committee we are pleased to submit this nomination package for the 2014 CETL Geoffrey G. Eichholz Faculty Teaching Award for Professor Donald Webster. Enclosed is a nomination letter from the chair of the school that reflects the sentiments of all those on the awards committee. Also included are supporting letters, the endorsement of the students who have been fortunate enough to be taught by Professor Webster, and Dr. Webster's Statement on Teaching and Summary of Course Instructor Opinion Summary.

Marc Stieglitz
Associate Professor
School of Civil and Environmental Engineering
and School of Earth and Atmospheric Sciences
Georgia Institute of Technology

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Georgia Tech School of Civil and Environmental Engineering
College of Engineering

Georgia Institute of Technology
Atlanta, GA 30332-0355

15 January 2014

Joyce Weinsheimer
Deputy Director
Center for the Enhancement of Teaching and Learning
Georgia Institute of Technology

Dear Dr. Weinsheimer,

I am writing in support of the nomination of Dr. Donald Webster for the CETL Geoffrey G. Eichholz Faculty Teaching Award. Over the past 4 semesters, Dr. Webster has performed an experiment to "flip" two of our core undergraduate mechanics course, specifically junior-level CEE3040 Fluid Mechanics (Spring 2013, Summer 2013, and Spring 2014) and sophomore-level CEE2040 Dynamics (Fall 2013). As described below, the innovation is a substantial change from the traditional approach for teaching core mechanics courses, which typically consists of instructor-driven lectures supplemented with out-of-class problem solving assignments.

The innovation is to use emerging online technologies to shift the in-class experience from a traditional lecture to a collaborative learning environment. The objective is to transform student in-class participation from that of a passive listener to that of an active problem solver. Prior to class, students watch short (average 11 minutes) video lectures (recorded via Tegrity software) that include topical presentations and example problem solving exercises. During class, students work in teams of two on personalized white boards to actively solve applied problems. The instructor and teaching assistants are present to provide "just-in-time" tutoring. The total number of team problems assigned during the semester exceeds 100 (typically 2-5 per session). Further, an online Quiz (4-5 problems) is assigned each week to gauge student advancement. The online system (WileyPlus) generates unique problem parameters for each student, thus again demanding active individual participation. In addition, three mid-semester exams and a final exam are administered in the classroom. A web app (Net-texts) was used to organize all online course elements for easy student access via computer, tablet or smart phone. The Net-texts site for the Spring 2014 section is available here: http://net-texts.com/Courses/3372/CEE3040-Fluid-Mechanics-Spring-2014

The innovation has been evaluated via comparisons of common Final Exam performance with previous semesters of the course (traditional offerings) taught by Dr. Webster and to simultaneous sections taught by another instructor. In all comparisons, the flipped classroom approach produced superior student performance. For example, the students in the Summer 2013 section performed better on a common Final Exam than the students in Dr. Webster's

traditional section in Fall 2012 despite having lower incoming GPAs (statistically significant difference). Four students in the Summer 2013 section had previously failed CEE3040 Fluid Mechanics. All four passed the course and one received an A. Further, Dr. David Majerich (of the Center for 21st Century Universities) has shown via regression analysis that attendance and participation in the individual problem-solving sessions has a direct positive effect on student scores on the Final Exam as well as the Concept Inventory. In addition, extensive survey data have been overwhelmingly positive. Nearly every student indicated that they would recommend the course format to a friend. Notable themes of the survey comments include students liking the lecture videos because of flexibility and control, students appreciating the team problem solving sessions (active participation), and students appreciating the ability to ask the instructor and teaching assistants for immediate (just-in-time) help.

To date, Dr. Webster has worked with eight other instructors in CEE to develop flipped formats for their course, as well as an instructor from ECON and another from COE. As part of this effort, the founder of Net-texts (CEE alumnus Mike Messner) has provided financial support to further develop the flipped classroom innovation. In addition, Dr. Webster was a panelist at the well-attended CETL workshop on flipping classrooms on November 21, 2013. He also presented the innovation and evaluation results at the American Physical Society Division of Fluid Dynamics meeting in November 2013 and is scheduled to present at the Ocean Sciences Meeting in February 2014. Further, he and Dr. Majerich have received IRB approval for their study of student performance in the flipped classroom format (for the Fall 2013 CEE2040 Dynamics section), and they will be publishing their evaluation of the innovation in the near future. They are currently conducting a similar study for CEE 3040 Fluid Mechanics during Spring 2014.

In summary, Dr. Webster is an enthusiastic instructor of our core mechanics courses, and the flipped classroom innovation has already had an incredible impact. He is eminently worthy of being honored by the CETL Geoffrey G. Eichholz Faculty Teaching Award.

Sincerely,

Reginald DesRoches, Ph.D.
Karen and John Huff School Chair and Professor

Georgia Tech College of Engineering
College of Engineering
Office of the Dean

February 17, 2014

CETL Awards Committee

RE: Nomination of Don Webster for Eichholz Faculty Teaching Award

Dear Committee Members:

Don Webster could have said, "No" when we invited him to be the one in the College of Engineering to experiment with flipping his fluid mechanics class. As a veteran with consistently high CIOS scores, his pedagogy in this class seemed to be working quite well. At least the students perceived it to be so. Perhaps, however, it was Don's long familiarity with the course content and its difficulties rather than the CIOS scores that caused him to consider the offer to "flip" a high visibility course in the College. So he agreed. In preparation, he visited Joe LeDoux's Problem Solving Studio to get a feel for what the class side of flipping would look like. As suggested, he contacted the authors of an old paper to get a copy of a Concept Inventory test that could be useful in measuring the impact of the course. Then, over the term, he created short 8-10 minute mini-lectures in an application called Tegrity for students to watch prior to coming to class. This was a tedious, time-consuming and challenging task even for a professor having deep familiarity with the course content. A significant number of decisions needed to be made. How to chunk the material into small learning nuggets, how to stage his lectures so students could not just hear him, but see what he was doing, how to organize and arrange class time such that it would build on the mini-lectures. You might liken this work to taking down a house and rebuilding it with the same pieces but in a different style.

By January, he was ready to go with his Beta version of the course. In that term, he learned a lot through observation and data collection. He saw how working on separate sheets of paper sabotaged his desire for students to interact and collaborate. He saw how allowing a top student to work alone as requested, robbed him of a class asset. He developed strategies for interacting with the students as they worked that facilitated deeper thinking and engagement with the material. He learned interactive strategies from his graduate student TAs as well. He marveled at how the flipped environment offered him unprecedented visibility to the problems students were having, problems of which he had been unaware in a lecture format. Midway, he administered critical incident surveys to find out when students felt most and least engaged. These were very revealing. One student confided that she had thought that she could never do well in the course, but was building her confidence by working with other students and interacting with the instructors in class. Overall the feedback was very positive. At mid-term, he noticed something important. There was almost a ten-point difference on the mid-term test between those coming to the class and

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working problems, and those who were not coming. When he passed this on to the class, suddenly class attendance shot up.

By summer, he was ready to conduct a controlled educational experiment to test the efficacy of the flipped classroom. In this experiment, he discovered that the summer students who overall had lower GPAs performed better on an identical final exam, compared to the fall 2012 group who had higher GPAs overall.

Don Webster deserves the Eichholz Faculty Teaching Award three reasons. First, he took on the challenge of redesigning an important COE course to promote greater student engagement and faculty-student interaction. If he could demonstrate the value of this educational experiment in a high visibility COE course, then this could be the watershed event for stimulating other faculty to try similar innovations. Secondly, he took a scientific approach to flipping a classroom. He worked closely with David Majerich to collect data and do regression analysis, so that the results were not just anecdotal but solidly quantitative. Thirdly, he has been an evangelist for flipping, giving well-attended research talks on his educational experiment that have been a catalyst for others to try a similar pedagogy. We strongly endorse his nomination.

Sincerely,

Laurence J. Jacobs
Professor & Associate Dean
for Academic Affairs

Wendy C. Newstetter, Director
Education & Research Innovation

Georgia Tech Center for 21st Century Universities

January 22, 2014

Dear CEE Awards Committee:

I have been asked by Dr. Donald R. Webster to write on his behalf in supporting his nomination for the Eicholz Faculty Teaching Award. It is indeed a personal privilege and honor to comply with Don's request to describe his efforts to upgrade, embellish and strive for excellence in engineering education and the impact that these efforts have on students.

Don has sent me some copy of the requirements for the Eicholz Faculty Teaching Award and much of it reads very much like a personal characterization of Dr. Webster and all his work and accomplishments as of this moment in time. I was introduced to Don in the Spring of 2013. At the time of the meeting, Don described to me the research that he was conducting in an attempt to improve student learning outcomes in the fluid mechanics course taught in the CEE department. His research plan was to include course-related data collected from his students from three different sections of the course over a three-semester time span (Fall 2012, Spring 2013, Summer 2013). The Fall 2012 was used as a comparison course for the other two courses taught with a new strategy. He articulated with precision his educational research and teaching endeavors plus his very recent updated attempts in the field as applied to his course. He shared his teaching technique that is currently entitled the flipped classroom approach. In that description, Don identified the role of the instructor, the role of the students, the role of technology, the importance of collaborative group work for problem solving and formative assessment. He showed to me his carefully recorded lecture videos associated with the technology-based platform that were made accessible to students any time during the day or night. These lecture videos were posted online so that students could view or review them at a convenient time outside of class so that he and his students could apply the material that they learned when in class. Another aspect that was technology-based was the use of an online platform for students to complete homework and to immediate feedback when answers were submitted. Don applied basic descriptive statistics to the data that he collected from his students. He was able to show that what he was doing in the creation of this novel learning environment did indeed improve the student learning of course material and problem solving skills, that more students were being retained in the course, and those students who were repeating the course were performing much better the second time taking the course. What became increasing clear in the conversation was the fact that Don had in his mind a model of teaching that he was crafting and refining, as well as substantiating its use with empirical evidence. However, the good results derived from the use of descriptive statistics did not tell an adequate enough story for his wonderful innovative approach to teaching fluid mechanics.

Working with anonymized data, I joined Don in examining his approach to better understand his flipped classroom strategy and the impact that it had on students. We performed a regression analysis to quantify the effects of his intervention by comparing the three courses for which data were collected. Student-level characteristics were part of the prediction equation for the research. In addition, an important predictor variable that was directly related to his flipped classroom approach to teaching (i.e., problem solving sessions attended for individual students) was found to be a significant predictor for student achievement in the class. Please recall the in-class problem solving sessions were where students worked collaboratively to solve problems while receiving formative assessment feedback given by the instructor to guide the students to success. The model of teaching using the flipped classroom approach that was

only anecdotal earlier in the research now had been refined, tested, and substantiated with empirical evidence. What Don has in place is a curricular innovation taught using a proven pedagogical technique to improve student learning and problem solving. The impressive results from Don's curricular and pedagogical innovation have been accepted by three professional conferences and have been discussed at several of CETL's own professional development workshops.

During the Fall 2013, Don's pedagogical and curricular innovation was applied to a dynamics course in the CEE department. One section of the course was taught using traditional approach to teaching, and the other was taught by Don using the flipped classroom approach that was refined in the fluid mechanics course. The section of the course taught by Don outperformed the comparison section on problem solving and they had a higher conceptual understanding of course topics. The results also showed that the number of in-class problem solving sessions attended by students was a significant predictor of student success. Please recall that this variable is directly related to his pedagogical innovation. The flipped classroom model that was developed in the fluid mechanics class was replicated in the dynamics course with similarly impressive results. Currently, Don and I are conducting another study to analyze student learning and student engagement in a flipped dynamics course taught with the flipped classroom approach that he carefully crafted and refined over time.

Look at the significant work he has done to improve the teaching and learning in his classroom – few instructors can boast of such. With all of the new initiatives in our field on the horizon, Don is definitely the one to be a leader in the field and carry them to the utmost height and execution. What has been described in this letter is only the beginning of a new and glorious era for Don and his GA Tech endeavors.

With the aforementioned stated, I recommend Dr. Donald R. Webster for the prestigious Eicholz Faculty Teaching Award.

Most Sincerely,

David M. Majerich

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Dear CETL Eichholz Faculty Teaching Award Committee,

I would like to recommend Dr. Donald Webster for the 2014 CETL Eichholz Faculty Teaching Award. I had the opportunity to take Dr. Webster's CEE 3040 (Fluid Mechanics) for the Summer of 2013. The way the class was conducted enabled me to learn an exceptional amount about Fluid Mechanics.

Dr. Webster used a "reverse-classroom" approach for the class. This was the first time I had taken a class like this. I enjoyed the way the class was conducted. Dr. Webster would post a few "mini-lectures" on the class website to be watched outside of class at our convenience, while we would work problems with a teammate in class.

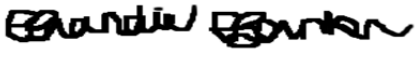
I truly wish all of my problem-based classes were conducted in this manner. First, the videos Dr. Webster posted were truly the "meat-and-potatoes" of the material. The videos were succinct and extremely helpful- usually covering conceptual material and an example problem. Another benefit to the videos was that I was able to replay them at my own convenience; this was a large help whenever I was particularly confused on a subject or while I was studying for exams.

One of my favorite parts of the class was I was able to get to know my instructors (Dr. Webster and our Teaching Assistant Aaron), as well as my classmates, much better than in a typical classroom. It created a greater sense of community within the class, and encouraged a much more collaborative environment.

In a typical classroom experience, I find it is often easy to become disengaged during lecture, or give up when I get "stuck" on a problem outside the classroom. Neither of these issues played a role in my CEE 3040 experience. I was always engaged in the material, trying to figure out how to solve the problems with my teammate. If I we got stuck on a problem, we were immediately able to ask for further explanation for Dr. Webster or Aaron.

I highly recommend Dr. Webster for this award because of the way he conducted my Fluid Mechanics class. The reverse-classroom approach is truly an innovative way to help students learn the material, work together, and stay engaged. If all my classes were reverse-classroom, I know I would have a firmer grasp on the concepts of Civil Engineering and have stronger relationships with my professors and classmates.

Sincerely,
Brandie A. Banner



To whom this may concern:

Our names are Jordan Shields and Emily Flood. We are both 4th year Environmental Engineering majors. We were students in Dr. Donald R. Webster's fluid mechanics class in the summer semester of 2013. During this course, we were exposed to the flipped classroom teaching method for the first time, and found it to be very effective.

Having the ability to watch the video lectures on our own time allowed us to absorb the material successfully. When a concept was confusing, we were able to watch the lecture again in order to better understand the topics that would be practiced in class.

The practice problems we did in class were extremely beneficial. They allowed us to practice the concepts we had learned in the lecture videos. If a concept was unclear or we had a question regarding a particular problem, Dr. Webster and his TA were always there to offer clarification and assistance. We were able to have a better grasp of concepts and practice how to apply them due to the ample amount of problems we completed. Studying for each exam was far easier than in any other engineering, problem-based course because we did not have to re-learn any concepts and had plenty of material to review.

In conclusion, the flipped classroom teaching method introduced by Dr. Webster is the best learning experience we have had during our time at Georgia Tech. We hope this technique will be adapted by other instructors in the future.

Sincerely,

Emily Flood & Jordan Shields

CETL Awards Committee:

We took Dr. Webster's flip classroom CEE 3040 Fluid Mechanics course in the Spring of 2013. It was the first flipped classroom either of us had ever taken. Instead of a "normal" class, Dr. Webster posted his lectures online for students to watch before class. Class time was then spent solving problems that focused on the lecture material.

This style of teaching works well for students on several different levels. Because the lectures are posted online, students can follow along at their own pace. They can even review the lectures as often as they like – before an exam, for example. The in-class problem solving reflects what we have found to be true in our other engineering studies: repetitive problem solving is necessary to completely digest and understand mathematical applications. Example problems often seem very simple when the professor is explaining them, but doing a similar problem by oneself can be very different.

Dr. Webster and two teaching assistants are in class to help students with problem solving techniques. This provides benefits that traditional classrooms do not, such as immediate feedback and professor-student interaction. If we didn't understand a certain concept, when a some application was valid, or what "tricks" were useful to solving a specific problem, we could ask for help immediately. This in turn helped us when we began our homeworks, as we had already addressed many preliminary issues with the material. As we mentioned, the class offers more interaction with the professor, which makes him seem much more approachable.

We both excelled in this class due to its unique and innovative approach to teaching material. Because we understood the material, we came to enjoy it. As a result of taking this class with Dr. Webster, we both joined his research lab and will be pursuing graduate degrees in the Environmental Fluid Mechanics and Water Researches Department in Fall 2014. We have had the unique experience of both taking a flipped class and serving as a grader, a role in which we attend all class meetings and help students solve problems. This expands not only our understanding of the material, but also our ability to communicate concepts and be understood by others.

In conclusion, we feel that this teaching method works because it allows students to learn at their own pace, provides a convenient forum for professor-student interaction, and engages students. As teaching assistants, these classes still provide learning opportunities in which we can develop academic and professional skills.

Thank you for your time.

Sincerely,

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Statement on Teaching – Donald R. Webster

I have 19 years (17 years at Georgia Tech) of experience teaching undergraduate courses (primarily fluid mechanics, which is a core engineering topic). In the late 2000's I had become quite frustrated with what I viewed as a highly ineffective cycle in the classroom. I would assign homework problems from the textbook each week (i.e., a traditional approach) and many of the students would essentially copy the solution manual from the internet or another source (although usually not blatantly enough to confront cheaters). After the exams, the students would complain that the exam problems were so much more difficult than my examples in lecture and the homework problems. The underlying problem was that they simply were not doing the work to master the material. I thought of several remedies including writing my own homework questions, and I was very receptive to new ideas to improve the learning environment.

2010 marked my first positive foray into using online technology to enhance the learning environment. The Wiley rep approached me about beta testing their WileyPlus online system. A huge selling point for me was the fact that each student receives a different set of input parameters for the assigned homework problems. Hence, each student has to do the computations, at the very least, even if they have access to the solution manual. An additional benefit is that the students receive immediate feedback on their work rather than waiting for my handwritten comments days later. I immediately saw improved student performance even with the modest change of adopting the WileyPlus system.

In August 2012, Wendy Newstetter and Larry Jacobs in the COE Dean's Office approached me about possibly flipping a core fluid mechanics course. To be honest, my preparation during Fall 2012 was terrifying. For example, if I deliver my lecture note content (highly refined from years of delivery) in a totally new format (i.e., pre-recorded videos), what do I during the nearly 45 hours of class time? And will that in-class activity improve the learning experience? If the flipped classroom is a flop, then what is the back-up plan? I consulted with several instructors who had attempted some aspects of what I was imagining. Slowly, I pieced together a plan, tested and selected the needed technology elements, and developed the in-class exercises and structure. This effort was roughly equivalent to the time required to develop a new course from scratch (for a class that I had taught 10 or more times previously). In January 2013, my first flipped class (described well in Dr. DesRoches' letter) went live. Within days, it was abundantly clear that this method was superior to my traditional offering (in every definable way). I have refined numerous aspects of the methodology over the past 3 semesters (CEE3040 Fluid Mechanics in Summer 2013 and Spring 2014; CEE2040 Dynamics in Fall 2013), but the core idea was a tremendous success: using online technology to fundamentally alter the course experience by encouraging students to engage in active problem solving with "just-in-time" tutoring by the instructor and TAs.

I am very pleased that David Majerich's multi-variable regression analysis shows a direct effect of the problem solving sessions on exam scores. His analysis quantifies what is so very obvious to me: the students are mastering the material at a much higher level. Student feedback completely surprised me. I was expecting a broad range of responses due to students having a variety of learning styles and preferences. Instead, student feedback has been extremely positive (nearly uniformly). And here's another shocker: student reported time spent on the course in the CIOS is nearly identical to the traditional offering. This method requires that they spend their time very differently, but the amount of time they spend is the same! And the achievement of the learning objectives is superior!

In summary, I am so glad that I took the leap of faith to develop the flipped class model for these core mechanics courses. This "experiment" forced me to re-examine (or examine for the first time) every aspect of the course(s). My approach and preparation has been turned inside-out in the process. And the student's role also has been dramatically altered – specifically the focus is now on their active participation and their ownership of the learning process.

DONALD R. WEBSTER, PH.D., P.E.
Professor & Associate Chair
Civil and Environmental Engineering

SUMMARY OF COURSE INSTRUCTOR OPINION SURVEY

Undergraduate Courses

Qtr/Sem Taught	*Course No.* *Course Name*	*No. Enrolled*	*No. Respond.*	*Median Score for "The Instructor was an Effective Teacher"*
Spring 2014*	CEE3040 Fluid Mechanics*	-	-	-
Fall 2013*	CEE2040 Dynamics*	37	22	4.9
Summer 2013*	CEE3040 Fluid Mechanics*	24	16	4.8
Spring 2013*	CEE3040 Fluid Mechanics*	39	25	4.9
Fall 2012	CEE3040 Fluid Mechanics	29	18	5.0
Spring 2012	CEE2040 Dynamics	48	31	4.7
Spring 2012	CEE3040 Fluid Mechanics	22	11	5.0
Fall 2010	CEE3040 Fluid Mechanics	67	33	4.8
Spring 2010	CEE2040 Dynamics	44	30	4.8
Fall 2009	CEE3040 Fluid Mechanics	39	21	5.0
Fall 2008	CEE3040 Fluid Mechanics	60	22	4.7
Fall 2007	CEE3040 Fluid Mechanics	65	34	4.9
Summer 2007	CEE3040 Fluid Mechanics	36	6	4.8
Fall 2006	CEE4200C1 Hydraulic Engineering	14	6	4.9
Fall 2006	CEE4200C2 Hydraulic Engineering	19	13	5.0
Fall 2006	CEE4200C3 Hydraulic Engineering	16	8	4.7
Fall 2006	CEE4200C4 Hydraulic Engineering	14	7	4.9
Summer 2006	CEE3040 Fluid Mechanics	24	11	4.8
Spring 2006	CEE3040 Fluid Mechanics	75	43	4.3
Fall 2005	CEE4200C1 Hydraulic Engineering	18	9	4.4
Fall 2005	CEE4200C2 Hydraulic Engineering	14	8	4.8
Fall 2005	CEE4200C3 Hydraulic Engineering	11	5	4.3
Fall 2004	CEE4200C1 Hydraulic Engineering	15	5	5.0
Fall 2004	CEE4200C2 Hydraulic Engineering	15	10	4.7
Fall 2004	CEE4200C3 Hydraulic Engineering	16	6	5.0
Spring 2004	CEE4200C1 Hydraulic Engineering	18	15	4.7
Spring 2004	CEE4200C2 Hydraulic Engineering	17	10	4.7
Spring 2004	CEE4200C3 Hydraulic Engineering	20	8	4.7
Spring 2004	CEE4200C4 Hydraulic Engineering	16	9	4.9
Summer 2003	CEE4200C1 Hydraulic Engineering	15	10	4.9
Summer 2003	CEE4200C2 Hydraulic Engineering	18	12	4.8
Fall 2002	CEE3040 Fluid Mechanics	64	31	4.7
Summer 2002	CEE3040 Fluid Mechanics	32	19	4.8
Spring 2002	CEE4200C1 Hydraulic Engineering	20	9	4.9
Spring 2002	CEE4200C2 Hydraulic Engineering	20	11	4.8
Spring 2002	CEE4200C3 Hydraulic Engineering	18	10	4.7
Summer 2001	CEE4200C1 Hydraulic Engineering	20	12	4.5
Summer 2001	CEE4200C2 Hydraulic Engineering	20	10	4.7
Fall 2000	CEE4200C1 Hydraulic Engineering	16	10	4.8
Fall 2000	CEE4200C2 Hydraulic Engineering	10	5	4.3
Fall 2000	CEE4200C3 Hydraulic Engineering	9	4	4.8
Fall 2000	CEE4200C4 Hydraulic Engineering	3	2	4.5

* flipped classroom format

Summer 2000	CEE4200C1 Hydraulic Engineering	15	9	4.6
Summer 2000	CEE4200C2 Hydraulic Engineering	13	8	4.3
Spring 2000	CEE4200C1 Hydraulic Engineering	11	6	4.3
Spring 2000	CEE4200C2 Hydraulic Engineering	16	9	5.0
Spring 2000	CEE4200C3 Hydraulic Engineering	5	3	4.8
Spring 2000	CEE4200C4 Hydraulic Engineering	13	5	4.7
Winter 1999	CE 3061B Fluid Mechanics Laboratory	18	15	4.8
Winter 1999	CE 3061A Fluid Mechanics Laboratory	23	22	4.5
Fall 1998	CE 3061C Fluid Mechanics Laboratory	17	15	4.4
Fall 1998	CE 3061A Fluid Mechanics Laboratory	14	14	4.6
Spring 1998	CE 3061D Fluid Mechanics Laboratory	21	21	4.3
Spring 1998	CE 3061A Fluid Mechanics Laboratory	17	13	4.8
Fall 1997	CE 3063 Fluid Mechanics II	54	29	4.2
Average for Undergraduate Courses		24.5	13.8	4.7

Graduate Courses

Qtr/Sem Taught	*Course No.* *Course Name*	*No. Enrolled*	*No. Respond.*	*Median Score for "The Instructor was an Effective Teacher"*
Spring 2014	CEE6293 Hydrodyn Stab & Turb	-	-	-
Fall 2011	CEE6251 Fluid Mechanics	25	17	4.9
Spring 2011	CEE6293 Hydrodyn Stab & Turb	14	8	4.9
Fall 2009	CEE6251 Fluid Mechanics	22	12	4.8
Spring 2009	CEE6293 Hydrodyn Stab & Turb	11	9	5.0
Fall 2007	CEE6251 Fluid Mechanics	14	10	4.9
Spring 2007	CEE6293 Hydrodyn Stab & Turb	9	8	4.8
Fall 2006	CEE6263 Fluid Mech of Organisms	11	8	5.0
Fall 2005	CEE6251 Fluid Mechanics	15	8	5.0
Spring 2005	CEE6263 Fluid Mech of Organisms	14	9	4.8
Spring 2005	CEE6293 Hydrodyn Stab & Turb	11	9	5.0
Fall 2003	CEE6251 Fluid Mechanics	13	11	4.9
Spring 2003	CEE6293 Hydrodyn Stab & Turb	12	9	4.6
Fall 2002	CEE6263 Fluid Mech of Organisms	19	15	4.8
Fall 2001	CEE6251 Fluid Mechanics	19	14	4.2
Spring 2001	CEE6293 Hydrodyn Stab & Turb	20	12	4.9
Fall 1999	CEE6251 Fluid Mechanics	10	10	4.7
Spring 1999	CE8103N Flow Instabilities & Turb	19	19	4.7
Winter 1998	CE8103L Flow Instabilities & Turb	5	5	-
Average for Graduate Courses		15.1	11.1	4.8

* flipped classroom format