

Semester	Course	Credits	Students	Curriculum feature	Q16, Q25 Scores
Fall 2017	PHYS135A-01	4.0	24	Intro	$3.19 \pm 1.57, 3.24 \pm 1.55$
Fall 2017	PHYS150-01	4.0	17	COM1/Intro	$3.56 \pm 1.26, 3.13 \pm 1.63$
Spring 2018	PHYS135B-01	4.0	18	Intro	$2.94 \pm 1.30, 3.12 \pm 1.36$
Spring 2018	PHYS180-02	5.0	19	COM1/Intro	
Spring 2018	COSC330/PHYS306	3.0	6	Advanced	
Fall 2018	PHYS135A-01	4.0	24	Intro	
Fall 2018	PHYS135A-02	4.0	26	Intro	
Jan 2019	COSC390	3.0	8	Advanced	
Spring 2019	PHYS135B-01	4.0	25	Intro	
Spring 2019	PHYS180-02	4.0	9	Intro/COM1	
Fall 2019	PHYS135A-01	4.0	24	Intro	
Fall 2019	PHYS150-02/03	4.0	26	COM1/Intro	
Fall 2019	INTD255	3.0	23	CON2	
Spring 2020	COSC330/PHYS306	3.0	13	Advanced	
Spring 2020	PHYS135B-01	4.0	23	Intro	
Spring 2020	PHYS180-02	4.0	24	COM1/Intro	
Summer 2020 (Session II)	MATH080	3.0	11	Intro	
Fall 2020 (Module 1)	INTD100-21	3.0	14	Intro	
Fall 2020 (Module 2)	PHYS330	3.0	11	Advanced	
Spring 2021 (Module 1)	INTD290	3.0	26	CON2,CUL3	
Spring 2021 (Module 2)	PHYS135B-02	4.0	17	Intro	
Spring 2021 (Module 3)	PHYS135B-01	4.0	25	Intro	
Fall 2021	COSC330/PHYS306	3.0	16	Advanced	
Fall 2021	PHYS135A-01	4.0	24	Intro	
Fall 2021	PHYS135A-02	4.0	25	Intro	
Jan 2022	COSC360	3.0	16	Advanced	
Spring 2022	PHYS135B-02	4.0	25	Intro	
Spring 2022	PHYS330	3.0	12	Advanced	
Summer 2022	MATH080	3.0	3	Intro	
Stud./Cr.: 5.1	Cr./Course: 3.6	Stud./Course: 18.4	Cr./year: 21	Adv./Total: 24%	

Table 1: This table is a summary of courses taught in five years, plus Summer sessions. Not included: PHYS396 (Physics Research for Credit), PHYS499 (Senior Seminar), and PHYS495 (Independent Studies).

The data in Tab. 1 are meant to share a portrait of my teaching over the last five years, not including Fall 2022. Appropriate benchmarks in my department are to teach 20 credits per year, and I have hit 21 credits per year, without including physics and engineering research for credit (PHYS396). Our average student-to-faculty ratio is 12, meaning my courses tend to have 6 or more students above average (18.6), or about a 55% increase. All of my courses are either 3 or 4 credits, excluding things like PHYS396 (variable 1-3). The average is 3.6 credits per course, meaning a slight majority of my credits come from 4-credit courses. I have achieved a students/credit ratio of 5.1, again indicating that I teach more students than most of our colleagues at Whittier. For example, a standard 3.0 credit course with 12 students would have a students/credit ratio of 4.0. A ratio of 5.1 indicates that I teach $\approx 20\%$ more students/credit. I have taught a mixture of introductory STEM courses, liberal arts courses, and advanced technical subjects. About three quarters of my courses have not been advanced technical subjects. In summary, this represents a healthy mixture of teaching for an assistant professor at Whittier College.

0.0.1 Summary Reflection on Teaching

Before turning to my scholarly work, it is important to reflect over the past 4 years¹ of teaching experience to highlight my long-term growth and development. This reflection is intended to provide context for those who have not encountered my previous teaching results and analysis. In the reflections below, I remain as concise as possible while covering the Fall 2018 semester until the present day. There are three main themes. The first theme is that learning to teach introductory physics courses in my first several semesters required major adjustments. In my teaching roles within my post-doctoral fellowships, I was constantly exposed to high-performing students in technical subjects. The transition to teaching students with diverse levels of preparation required three changes in my style that we made based on student evaluation data. The positive effect these changes made was analyzed in fine numerical detail in my supplemental PEGP submitted in Fall 2019. Since then, my scores in introductory physics courses have remained high and generally feel successful despite the challenges of the pandemic.

The second theme is that I have applied a balanced version of these lessons to advanced physics and computer science courses with great success. I have earned high scores consistently in these courses, with few exceptions. I have taught advanced physics courses and advanced computer science courses. The most difficult course to maintain in this regard is Computer Logic and Digital Circuit Design (COSC330/PHYS306). The first time I taught this course was during my transition to teaching introductory physics at Whittier College. We struggled with the material, primarily because the textbook and lab workbooks I chose were too difficult and also tailored for students at MIT. Since then, I have chosen a much better book, and I have incorporated open-source digital circuit boards and code platforms. The students loved

¹I confirmed with the chair of FPC that a 4 year window is the standard, so my reflection covers Fall 2018 until the present.

this material the second and third time I taught COSC330. There were a few downsides to expanding the course to 16 students that I described in Sec. ??, and these are easy to fix.

The third theme is that I have a proven track record of being able to teach outside my comfort zone. This includes two sections of INTD100 and two CON2 and CUL3 courses. The first CON2 course I taught, “Safe Return Doubtful: History and Current Status of Modern Science in Antarctica,” inspired a student to become a leader in wildlife conservation and inspired my WSP student to travel all over the world studying climate science. The course was very well received overall. The second CON2/CUL3 course I taught was History of Science in Latin America. As I covered in great detail in my prior PEGP, this subject is close to my heart given the Mexican-American heritage of much of my family. One student, Scout Mucher, found the course so inspiring from the standpoint of exploration that Scout decided to venture to Antarctica this Fall! My INTD100 sections tend to focus on technical and professional writing mechanics, with the themes of popular science writing and lately, the philosophy of science. The students seem to enjoy their time with me in these writing courses even though I have no training or experience as a English or literature professor. Finally, I recall your suggestion to bring back the History of Science in Latin America course. I assure you that I have not forgotten, and I plan to bring this course back after my potential sabbatical. I also have discussed taking on the responsibility of teaching Computational Physics from Prof. Lagan, who plans to retire in the next few years.