



I Did Not Anticipate This: Experiences from the Early Years

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Introduction

When a person aspires to become an engineering professor they are likely aware of the three big responsibilities they will have on the job: teaching, research, service. There is a big difference between being aware of the responsibility and the necessary steps to skillfully perform these responsibilities. A variety of resources are available to improve in these areas including first-year workshops¹, faculty forums, engineering education conferences, and much literature²⁻⁶. Even when talking with faculty advisers about what to expect when teaching the conversation will often focus on these three key areas. The importance of teaching, research and service is not lost on the new instructor as they will want to be strategic in securing their position. Thus it makes sense that aspiring instructors be well aware of these areas and their accompanying issues; however this does not paint the complete picture of life as an instructor.

What does the reality of being an instructor truly encompass? For most, this is something that evolves while they are on the job. Courses and workshops whose objectives are to prepare future faculty often focus on big picture tasks while failing to touch on the many everyday hurdles that one will experience. These challenges can be time consuming, controversial, cause significant stress, and have a tendency to blind-side junior faculty. However, many aspiring educators are likely unaware of the many everyday hurdles that they must overcome when they start teaching. These hurdles can nickel and dime an instructor's time making it harder develop curriculum, complete service and conduct research. These hurdles can also have just as much effect on teaching evaluations as actual teaching. These are the hurdles that the authors wish would have been articulated and discussed prior to starting their jobs.

The objective of this paper is to help new, or aspiring, engineering educators to be aware of common issues they will likely deal with including: academic misconduct, students with disabilities, student requests, and institutional requests. Each topic is discussed in order including how it affects a new faculty member, relevant literature, methods of handling, and examples of extreme cases faced by the authors in their first few years of teaching. The authors have teaching experience at five different engineering schools ranging from liberal arts schools to large research universities and the issues discussed appear to be ubiquitous in undergraduate engineering. Despite the various hurdles one faces, working at a university is an extremely rewarding career choice and this paper concludes by discussing some of the positive experiences which were also not anticipated but experienced. By confronting these topics in a frank and public manner others may learn from these collective experiences and perhaps find themselves better prepared when they arise.

Academic Misconduct

Aspiring instructors should be aware that academic misconduct (i.e. cheating) is rampant in engineering and many professors are faced with it every year, if not every semester. This

problem is ubiquitous and even occurs at highly selective schools such as Harvard⁷ and venerable military service academies⁸. Engineering students are reported to cheat at a higher level (74%) than social science or natural science students and only business students report a higher propensity for cheating⁹. Studies have further shown that 90-95% of engineering students use textbook solutions not distributed by the instructor¹⁰⁻¹¹. These studies also show that 77% of engineering faculty consider solution manual use as academic misconduct whereas 84-89% of engineering students think it is not misconduct regardless of their GPA.

Before delving further into the topic, it is important to note that the issue of academic misconduct is a complicated area of ongoing research and studies are not always in agreement. Some studies do show a slight correlation of lower GPA students being more likely to cheat¹²⁻¹³ whereas others do not¹¹. Some studies suggest that a reason for cheating is competition for grades with one's peers⁸ while others provide evidence to the contrary¹⁴. This may partly be explained by different student populations used for different studies. Further, Passow et al. have shown that the decision to cheat or not can vary depending on the type of assessment¹⁵ (homework vs. exam). In general terms, students are more likely to cheat on a homework assignment than on an exam. Hence, agreement between studies can also depend on what form of academic dishonesty students are being asked about.

Does it matter that engineering students cheat? Absolutely. Avoiding dishonest or deceptive acts is explicitly addressed in most, if not all, engineering codes of ethics (for example NSPE fundamental canon 5). As discussed by Passow et al., cheating also goes against the mission of most schools which often have a moral/character development dimension¹⁵. Thus, by allowing it to proceed unchecked an instructor is implicitly acting against the mission of their employer. Some studies suggest that academic cheating correlates with ethical transgressions later in life such as failing to follow workplace rules, marital infidelity, lying to customers, deceiving bosses, and cheating in graduate school¹⁶⁻¹⁸. It is thought that by committing a dishonest act one's sense of right and wrong can be altered so that the act is no longer viewed as immoral thus making it more likely to be repeated in the future¹⁹. Passow et al. have also suggested that students who cheat on homework in their first years of college without consequence may develop skills to allow them to continue to cheat, and on higher-risk assessments such as tests, as they progress through school¹⁵. Finally, cheating can lead to attitudes and/or habits that reduce student learning and therefore poses the risk of inadequately prepared practicing engineers¹⁴. A practicing engineer who has insufficient skills and questionable ethics could ultimately put the public welfare at risk. Students might also respond to the notion that they are paying for a good education which develops valuable skills and cheating essentially reduces the development of such skills which can lead to less success on the job. An analogy would be an Olympic athlete who pays for great coaches but skips practice; they would not expect to have the same success in their event as one who completes every practice diligently.

Prevention – Global Picture

Many studies have started to examine what can be done to prevent academic dishonesty from

occurring. When students feel that they are receiving poor instruction with confusing lectures, material whose usefulness is not recognized, an unreasonable workload and see the instructor as indifferent to student learning they are more likely to rationalize misconduct. Thus, many believe that increased instructional quality can result in less cheating^{14, 19}. When the relevance of the material and learning objectives are made clear to students studies show that cheating is reduced²⁰. These actions can lead to intrinsic motivation for the students to learn the material which lowers the propensity for cheating²¹.

Most students are aware that cheating is wrong and that they will be punished if caught¹⁴. Hence, the threat of sanctions may have limited impact. However, Passow et al. conclude that when a student has conviction that cheating is wrong despite the circumstances they will be less likely to cheat¹⁵, and thus one route to reduce cheating is to help students develop the moral sense of its impropriety. Students do make a distinction between acts that are cheating and acts that are unethical but not cheating¹⁴. Minichiello et al. suggest that greater ethical training of students starting their freshman year may help to align students convictions regarding misconduct¹¹ and hits on ABET General Criterion 3 Student Outcomes (f) which is “an understanding of professional and ethical responsibility²².” This may have the added benefit of promoting not just an individual’s understanding of the issue, but also creating a culture in the community which looks down on cheating.

Simply expecting students to do the ethical thing appears to not be working and thus faculty and institutional involvement is needed. Amongst engineering students, results have shown that only 21.6% agree that it is their responsibility to prevent academic dishonesty¹⁴ and instead place the responsibility on the instructor (79.3 % agree) and institution (72.5% agree). There is evidence to support the idea that honor codes can lead to lower rates of misconduct²³. Though simply having an honor code will likely produce a diminished effect unless faculty members engage students in understanding its importance¹⁴ and cases of misconduct are followed up on.

When students were asked if faculty support their institution’s academic dishonesty policies 48.8% of engineering students answered “somewhat” or “not at all¹⁵.” A survey of 800 professors at 16 institutions reported that 94% of faculty would seldom or never report cases of cheating to administration preferring instead to deal with them on their own²⁴. It was suggested that making formal charges is simply not worth the trouble and frustration and adds nothing to one’s evaluation as an instructor. In other words, it is not in one’s self interest, especially if administrators either don’t care or fail to back the faculty members when a case is contested. When cheating is only addressed at the individual level instead of the institutional level it is difficult to detect a repeated pattern of misconduct which should merit an increased punishment.

The above discussion addresses some global considerations for reducing academic dishonesty; the following addresses some specific methods discussed for dealing with cheating on homework and exams.

Prevention – Homework

The issue of cheating on homework is a particularly difficult problem to directly address because of the availability of textbook problem solutions on the internet (Chegg, Cramster, using google to search the problem statement). One could simply remove the issue by not having graded homework, however a strong case can be made for keeping homework in the structure of a course. According to Minichiello et al., students and faculty both largely agree (~95%) that completing graded homework helps students learn. Students overwhelmingly believe (98%) that solutions to textbook problems are useful for studying and 89% of students report that they attempt a problem before using a solution manual¹¹. Though students believe that following a solution can help their understanding, research has shown that engineering students perform better on homework and exams when they did not have solution manuals available when completing the homework²⁵. An additional conclusion from this study was that students who did not have access to a solution manual asked more questions of the instructor during office hours than students who could reference a solution manual. An additional study with engineering students showed inconclusive results regarding whether graded vs. un-graded homework correlates with exam scores²⁶. Further benefits of well-designed homework have been reported to include improvements in student preparation for class, out of class interactions between students and the instructor, and student motivation²⁷.

A recent paper by Gehringer and Peddycord outlines various strategies for dealing with the issue of students having access to textbook problem solutions²⁸. The following alternatives to using graded homework problems from the course textbook were presented:

Reduce the weight of homework and:

- increase the weight of exams
- give weekly/frequent graded quizzes
- increase the weight of projects

Use questions from other sources such as:

- new editions of textbooks
- automated testing system that randomizes parameters for each student
- self-made problems (i.e. write your own)
- swap problems with instructors at other schools
- take problems from a different textbook(s)
- have an assignment where students write problems and use some in future semesters

Obscure the source of the exercise and/or solution by:

- taking problems from other textbooks
- rewording questions making them harder to find with a text search

- changing the names of people/organizations in problems
- never distributing solutions with problem statements and not including the semester/year on problem/answer sheets

Use newer pedagogies which promote learning through an avenue other than homework

- Problem-Based Learning (PBL)
- Team-Based Learning (TBL)
- Process-Oriented Guided-Inquiry Learning (POGIL)
- Peer-Led Team Learning (PLTL)

Catch the cheaters

- have students explain the solution in their own words
- use questions for which the solution manual gives the wrong answer
- use questions with identical wording, but different values/units

Each of these strategies has both pros and cons. While lowering the weight of homework may remove incentive to cheat it can lead to cramming which is not good for learning. According to Aldosary exam performance correlated strongly with homework performance and it was suggested that putting more weight on homework may lead to improved exam performance²⁹. Gehringer and Peddycord also suggest that exams cannot assess the sum of student learning and that replacing homework grade weight by weekly quizzes is a better alternative²⁸. Alternatives to homework including projects or portfolios can improve student learning, but require more time and are harder to evaluate.

Trying to use homework problems for which students cannot find a solution becomes an arms race between the instructor and the students. This may require a significant amount of time from the instructor which could be better spent improving curricula or conducting research.

Transitioning away from homework and adopting a newer pedagogical strategy would also require significant effort on the part of the instructor which may or may not be beneficial in the long term.

Finally, catching cheaters is typically stressful, time consuming and can create a tension between the student and instructor making it less likely for a student to reach out for help when needed. It is also likely that an instructor will not catch all of the students who are committing academic misconduct as some may simply be smarter at disguising it on their homework. In this situation students who are committing the same offense are not receiving the same penalty which simply seems unfair and unjust, though unavoidable.

Prevention – Tests

To prevent cheating on tests one can consider walking the aisles during tests, having students remove hats, moving away from multiple choice questions towards essays, using different versions of the same exam and refusing to let students sit next to each other²⁴. Steps such as this

appear to have an effect, particularly when used in conjunction with classroom discussions on academic integrity. Kerkvliet and Sigmund¹² report that harsh warnings against cheating given right before a test reduce transgressions by 13%, including an additional proctor reduces transgressions by 11% and writing multiple versions of a test reduces transgressions by 25%. Harding suggests that cheating will be reduced for tests which are not convoluted, do not overwhelm the students, don't require memorization, allow reference sheets, address only material covered in class and can be finished in the allotted time³⁰. Harding further suggests allowing students 4 times the amount of time it takes the instructor to complete the test.

Prevention – Written assignments

Assignments that involve writing present an opportunity for students to plagiarize. However, most schools have access to software which will automatically check submitted assignments against the internet, a ProQuest ABI/Inform database and student databases for suspicious similarities. For schools which use Blackboard, there is a tool called "SafeAssignment" which an instructor can use when forming an assignment. For a "SafeAssignment" students must upload either a supported file type (.pdf, .doc, .docx, .txt., .rtf). Instructors are then provided with a report for each assignment that highlights any areas of overlap and provides a link to the source with which the overlap was found. Most schools are likely to have a similar tool. Students who are aware that their assignment will be automatically checked for plagiarism will be less likely to commit plagiarism.

Some good practices are:

- relay to them the importance of practicing good ethical judgment
- use an honor code which is discussed throughout the course
- make it a point to frequently explain the relevance of course material and why it is useful for them
- be clear about what you consider cheating for the different assessments you use and what is OK; put it on your syllabus and make it a point to discuss it throughout the class
- make it hard for them to cheat
- use plagiarism prevention software for written assignments
- explain the consequences of being caught cheating on the first day and in the syllabus
- report all cases of misconduct

The authors wish to make clear that it is not an instructor's fault if one of their students cheat; it is the fault of the student who decides to use poor judgment. Dynamic, fair and friendly instructors who take measures to dissuade cheating can still have students who will try to cut corners in their education. Thus, regardless of one's use of prevention strategies they will likely still have to deal with cases of misconduct. When a student is caught, it is best to call them to a meeting, be honest with them about the cause of the meeting, explain what your institutional/departamental procedure is for addressing misconduct, allow them an opportunity to address the issue and follow institutional reporting procedures. A person new to teaching may

also feel a sense of betrayal, however one should try to not take the student's misconduct personally. When meeting with the student it can be useful to explain to them that good people can make mistakes and most first offenses are not judged too harshly. If they are unclear on why their offense was considered misconduct help them understand. Be prepared for tears, denials, attempts at negotiations and requests for an opportunity to make up any points lost. After your meeting it is a good practice to record the date, time and details of the conversation and most institutions that have an office specifically for dealing with academic misconduct will require this. Regarding make-up opportunities one should consider that any opportunity offered to a single student would be considered unfair to the rest of the class. If one does want to allow an opportunity for points to be made up this should be available to all students in the class.

New faculty should make a point to read and understand their university's academic misconduct policy and should also be aware that schools differ in the amount of authority an instructor has in determining the penalty students face when caught cheating. Some schools allow an instructor to assign a failing grade; others allow the instructor to give the student a zero for the assessment on which they were cheating and make a recommendation to their Dean regarding anything more severe. The university academic misconduct policy should be included on every course syllabus and it is a good idea to give students time to read this policy word for word on the first day of class and answering any questions that they have regarding the policy.

Academic Misconduct Extreme Case 1: A new edition of a Thermodynamics textbook had just come out and the instructor incorrectly assumed that it might take a few months before students would have found access to the solutions. Graded homework was assigned from the textbook and despite explicit instructions one student blatantly plagiarized the solution manual. When the student was called into the instructor's office to discuss the matter they showed up with one of their relatives and another person who was introduced as a "friend." Before the topic of the plagiarism could be discussed the relative and friend accused the instructor of creating a "hostile environment" which had caused the student stress at many points during the semester. Once the conversation was eventually steered to the plagiarism, the work was described as simply being common engineering phrases and sketches. The exact match to the solution was claimed to be a coincidence. As this seemed to be an irrational conclusion the meeting was terminated and the student was told that they would be given a zero on the assignment and that they could meet with the Dean if they wanted to pursue further discussion on the matter. The instructor then contacted the Dean to inform him that he might be getting contacted only to learn that the student, the relative, and friend had met with the Dean to make the same accusations about the instructor before meeting with the instructor. It also turned out that the "friend" was in fact a lawyer. Upon seeing the evidence of plagiarism the Dean sided with the instructor and decided to handle all further communication on the matter with the student. It is recommended that if a student comes to a meeting regarding academic misconduct with other people that the instructor either not permit the other people into the meeting, or for the instructor to postpone the meeting to a time when the department chair or university lawyer can also be present.

Academic Misconduct Extreme Case 2: Another example occurred in an undergraduate Thermodynamics course. Again, graded homework was assigned from the textbook and the students were well aware that use of the solution manual was considered in violation of the institution's academic integrity policy. The course syllabus explicitly stated that using a solution manual was not allowed and the course instructor made this very clear during the first-day lecture. The solution to one of the assigned problems found in the publishers' solution manual had two issues that provided insight to the instructor that the manual was blatantly plagiarized. First, the solution started with an equation that was well beyond the material that the course had covered to date. Additionally, this equation was nowhere to be found in the textbook. Secondly, there was a unit conversion issue in the solution from the manual. These two errors were found in approximately one third of the homework assignments submitted by the class. The instructor typically made a point to return the graded homework in the first lecture after it was due. Instead, the instructor started the next lecture by showing the syllabus to the class on the projector and discussed the academic integrity section. The class was told that it appeared that a "large" amount of the class used the solution manual and therefore no one was going to be receiving their graded homework that day. The syllabus stated that plagiarism and any other form of academic dishonesty could be punishable up to failure of the course. The instructor then told the class after a long "awkward" conversation that if any students had something they wanted to tell him/her they would have 24 hours to do so. All of the students that appeared to use the solution manual stopped by and two additional students also stopped by to admit to using the solution manual. All of the students that admitted to using the solution manual were given zero credit for this homework assignment (2% of their total course grade) and internal academic misconduct forms were filed with the university. By handling this plagiarism issue in this manner the instructor opened a conversation about academic integrity with the entire class and also allowed the offending students to admit to using the solution manual. This opened up a discussion as to how the instructor/university could help the student when they are struggling rather than using a tool that is not helping their understanding of the material.

Students with Disabilities

Universities go to significant lengths to accommodate students with a variety of physical and learning disabilities. This can have implications for the engineering instructor when planning activities for lecture or lab. The most common situation an instructor will find themselves in regards students who are permitted extra time on exams do to their disability. Typically these students will submit a form to the instructor who then is supposed to complete the form and turn it in, along with the exam, to the disability services office at the university. Students then take the test at this office. This office commonly requests that the materials be turned in 24 hours prior to an exam which will require some instructors to plan ahead more than they are used to. If a student is visually impaired disability services will sometimes want materials turned in a week early so that they can be sent out to be converted into braille. Students may need to take the test at a different time than the rest of the class due to scheduling conflicts. This can create an

opportunity for academic misconduct by allowing a student who has not taken the test to talk with students who have taken the test. This concern can be reduced by writing a different test, however care must be taken as if the tests are too different a student might complain that one is easier than the other which will seem unfair. One final consideration that an instructor must make when teaching students who are permitted extra time on exams is the use of low-stakes tests/quizzes. Weekly quizzes in which students are given 5-10 minutes are great for motivating students to study and attend class regularly but creates the concern over when/where the student who gets extra time should complete the quiz. The authors have had some success in dealing with this by having the quizzes taken at the end of the class period so that students who need a few extra minutes can stay a little longer. It is noted that many students in the class prefer the quizzes to be at the start of the class as they believe that the presentation of new material that day will conflict with their ability to recall material from previous days.

Students with physical disabilities are often able to receive accommodations with any help they need during lecture from the disability services office. This can include recording devices, note takers, special desks, and microphones for the instructor to wear which allow the lecture to be transcribed in real time. Despite good intentions, the disability services office will likely be uncertain on how to accommodate these students in engineering lab classes. However, the authors have had students in wheelchairs, students who could not use their hands, and a student who was visually impaired successfully participate in hands-on labs. It is recommended that the instructor meet with the student at the start of class one-on-one to specifically ask the student for thoughts on how they can get the most out of lab. Further, disability services will often have funds available for an engineering student to be paid as a lab assistant for the disabled student. If not, the instructor can often identify students whose temperament seems well suited for partnering with the disabled student. It is further recommended that the instructor frequently check-in with the student regarding labs to see if any adjustments can be made. The goal should be to provide the student with adequate attention without overdoing it. One study has shown that giving students with disabilities the wrong kind of attention can lead to them dropping out of the sciences and engineering³¹. There are safety concerns that can arise, particularly in working with tools and certain measurement equipment. Experience has shown that students with a physical disability often want the opportunity to make the decision on what they can safely do rather than have an instructor make the decision for them. In one case a blind student was able to be taught how to successfully drill and tap aluminum with adequate supervision. This was the first time the student had been allowed to use a drill and they were excited at their accomplishment. Experience has also shown that students with a physical disability prefer to work on team-based hands-on projects rather than a project that accommodates their disability when given a choice. If their disability prevents them from actively participating in the physical construction of a project they will typically take on more responsibility in the design stage, ordering of parts, data analysis and/or report writing so as to make an equal contribution to the project.

Students whose disability is in the form of a neurodevelopmental disorder can be particularly challenging for both faculty new to teaching and experienced teachers. These students could have autism, Asperger's syndrome or distinct social, communicative and/or behavioral difficulties which may or may not have been diagnosed. Often times these students will not disclose their disorder to the university and even when they do the university is not allowed to inform the student's instructor. When asked, one director of disability resources stated that it was good for the university to know about a disorder so that they could accommodate the individual, but stated that it was not legal, nor appropriate to make the instructor aware as it would increase the likelihood of that professor treating the student prejudicially. While it seems unfair to assume that an instructor trying to accommodate a disorder is being prejudicial, the legality of the situation makes it a moot point. Though the university will not tell an instructor of a disorder, experience has shown that many students will disclose it to the instructor on a first day survey when asked "share something that you would like the instructor to know about you." Students with a neurodevelopmental disorder can be particularly difficult to work with on team projects, especially for first-year students who have had less practice working on an engineering team. An instructor can mitigate these problems to a small degree by frequently meeting with the team to help them stay on pace and ensure that all students are involved and being productive.

Student Disability Extreme Case: During a computer lab, Tom needed to retrieve some files from the computer on which Matt was working (these are not the actual names). Matt refused to permit Tom to get on his computer at which point the instructor asked Matt to log off momentarily to allow Tom access to his files. As Tom was retrieving his files Matt became agitated that it was taking so long and in his frustration began choking Tom right in front of the instructor. Students in the class broke it up and the instructor asked Matt to follow him outside of the building to cool off. After calming down Matt was allowed to continue working on a computer in a separate room from Tom. The instructor wrote up a detailed report of the incident immediately after class and discussed the incident with the Dean of engineering. The Dean of Students and director of disability services were then contacted and proceeded to deal with Matt. Matt had registered his disorder with the university but the instructor had been unaware of it. The lesson taken away from the instructor in this case was to pay closer attention when a student seems "slightly off" and to check in with them with a greater frequency.

Student Requests

A faculty member's time is split in many directions; between teaching lectures and laboratories, service to the department and university not to mention research and professional development, time is a very limited quantity for a faculty member. New faculty members feel this time crunch even more because they have to learn the systems at a new university in addition the developing of new lectures and a research program. Decisions are made daily as to how spend one's time most efficiently.

Faculty members are expected to teach well, serve the department and university, develop and maintain a research program and to remain current in their area of expertise. Commonly, it is expected for faculty to bring in external funding to support any research endeavors. New, or redesigned courses, are to be developed such that the educational program is current to attract students. Some, if not all, of these areas will be used to evaluate the performance of a faculty member. The metric that they will be compared against for decisions of tenure, or contract extension, is usually rather vague. All of this results in a new faculty member feeling rather unsure as to where to allocate their time. Should they be spending more time developing a research program and writing external grants? Should they focus on serving the department and/or university via committees or outreach?

These are the thoughts that a new faculty member will have in the back of their mind when a student stops by his or her office to ask a question. The requests from the students will come continuously, whether it is course topic clarification, homework assistance, letters of recommendation or just stopping by to chat. Understandably, the students are the reason that a faculty position exists, but one must be aware of the amount of time that student requests can consume.

The guidelines of both the American Association of University Professors (AAUP) and the Society for Teaching and Learning in Higher Education (STLHE) state that one of a faculty member's first responsibilities is to the students³². Although most new faculty members understand that the focus of their work will be interacting with the students, especially those at teaching focused institutions, the extent of this interaction can be a large consumption of time. While this is not a commonly published topic, it is well known that caring faculty who have respect for the students will build better relationships and ultimately provide a better learning environment for the students⁴. Reisel has stated that the first fundamental practice to gain the students' respect is to be available³³. By being available, this shows respect for the students and the students are more likely to be motivated to do well in the course and learn the material, which should be the goal of any instructor.

Being available to students is extremely valuable for the students, but it is just as important to be present and genuinely interested in responding to the students requests. Finding a sustainable balance in all aspects of this job is crucial for continued success in this career. It may be very difficult for a new faculty member to say no to a student request, but it is not possible to answer every question, always be available or spend hours of time talking with students. Shutting office doors and not answering if occupied with another task is one method to create a balance for the faculty member. While this may seem rude at first this will allow the faculty member to schedule time to complete their required tasks. Along with this, covering glass windows (if the new faculty member is lucky enough to have a window) creates some separation and allows for privacy. Experience has shown that students typically respect a closed door having a posted note stating the reason why a professor cannot meet (i.e. "writing in progress, please do not disturb").

The key is to create some scheduled time in order to complete the tasks required for the “faculty” side of the position, all the while showing that you are interested in the students’ success. By separating both the faculty component from the student interaction component both can be done more efficiently. Scheduling multiple office hours and making sure to be available is necessary. Make sure to be present with the student and not side-tracked or displaying any indication of wanting to be doing something else. Also, displaying genuine interest and concern for the students’ success and showing overall courtesy is vital in student-professor interactions.

New faculty members need to create a balance between all aspects of this position. Understanding that student requests will come in many forms, and from many directions, will help a new faculty member find balance. An awareness of the amount of time that these requests can consume is critically important to creating a sustainable schedule. This allows the faculty member to determine how many requests can be adequately addressed.

Student requests can take another form, one in which a student asks the instructor for special accommodations. This can come as a surprise to a new instructor as they were likely on top of their school work as an undergraduate and rarely had the need to make a special request. Some special requests that students can and will make include:

- extensions on assignments
- permission to complete a test/quiz or lab at a different time
- exemption from oral presentations
- exceptions for failing to adhere to attendance policies
- extra credit opportunities
- extra review sessions or review materials
- make-up tests or labs

These requests can be difficult to navigate as a professor wants to be caring and do what is best for the student, but also needs to be fair to all students in the class. If an instructor makes an exception for one student but does not offer that same exception to all students in the class it can be considered as unfair by other students. This will largely depend on the reasons for the request, which are incredibly varied. It is also important to point out that doing what is best for the student does not necessarily mean granting their request. If a student is unable to meet deadlines or understand grading policies without good cause it might be in their best interests to be sent a clear message that engineers need to conduct themselves professionally which means taking responsibility for their actions. Regarding extra credit, some students will request it after the final exam. Some will also request it late in a course which has already presented multiple extra credit opportunities which that same student did not take advantage of. When faced with such a request it is recommended that the instructor politely state that there will not be any extra credit and discuss how the student can best prepare for an upcoming test, or how to handle any repercussion which might come from getting a bad grade.

Student Requests Extreme Case 1: Writing letters of recommendation for students is one of the great honors that a faculty member may be asked by a past student when he or she is applying to graduate school or a job. These letters, which can be rather time intensive, allow the faculty member to discuss the past achievements and the potential for the student to succeed in the new position. So it was not surprising when a current student asked a new faculty member to write a letter on their behalf. This was not one of the stronger students but one that would ask questions in class and a regular during office hours to work through the homework. The letter that was requested was not for a job or internship but rather a letter to request leniency to the district attorney. The student was facing felony drug charges and if convicted would have to serve prison time and would lose any federal scholarships/loans. The faculty member decided to write the letter and the student was not charged with felony and continued with his college career. Writing letters of recommendation take time out of an already busy schedule but the goal of any institution and faculty member should be for the success of their students. By writing a recommendation, or in this case a letter of leniency, the instructor is hopefully helping the student to achieve their highest potential.

Student Requests Extreme Case 2: After final grades had been posted for the course a student who received a failing grade met with the instructor to ask that their grade be raised. Twice during the semester the student was made aware of their failing grade and encouraged to talk with the teacher to get the necessary help. This student felt that they knew the material well enough to deserve a passing grade even though their work did not show this and explained how their scholarships would be at risk because of their grade. The instructor informed the student that unless he had miscalculated the points earned on an assignment or test that the student's grade could not be changed. The instructor now mentions at the start of each course that there will not be any extra credit or possibility of a grade changing after the final exam and has received no other requests of this nature.

Institutional Responsibilities

Institutional responsibilities are often necessary for providing good undergraduate education, however they can take a surprising amount of time. Service activities such as fulfilling ABET assessments, curriculum development, faculty searches and college and university committees are necessary obligations of a faculty member. Curriculum review, graduate council, executive committee and assessment council are all examples of committees at the college and university level. It can be difficult to manage these demands, especially when success in scholarly activities and publications are the primary measure for promotion and tenure³⁴. This can be especially problematic for women and minorities who can be asked more often to join committees in order to fulfill diversity requirements³⁵. The typical advice for new faculty is to keep service to a minimum, as these activities, while necessary, typically are not weighted accordingly for the time commitment required. This is not always possible. A lack of tenured faculty due to high turn-over or a young department, or a fellow faculty member unwilling to fulfill service at an equitable level, all lead to circumstances where a higher than normal service

load is unavoidable. It is important to be aware that demands on the faculty's time will be numerous and many times unavoidable. In these cases several good practices can help maneuver and successfully navigate the bumpy road to tenure.

Good Practices Include:

- Picking a good mentor to provide advice on what activities are important and which ones should be avoided. This may not necessarily be the one assigned to you.
- Ask a faculty mentor or department chair to help block some of these requests before they reach the new faculty member, or to step in during meetings to politely say "No" for the new faculty member before they need to respond.
- Be ok with politely saying 'No', especially if you are a woman or a minority. These individuals tend to get asked more often in order to fulfill diversity requirements.
- Talk to experienced faculty about time commitment required for potential committee assignments before accepting a position.
- Accept one department committee, one college committee and after 2-3 years one university committee.
- Develop time management skills such as: checking email once or at most twice a day, setting aside one hour a day dedicated to writing manuscripts and limiting the time you allow yourself for preparing lectures.

Institutional Responsibilities Extreme Case 1: A lack of tenured faculty in a young and newly formed department left the untenured faculty with a significant service load. The service load included student advising, recruitment days, forming the department's curriculum and most importantly and time demanding: obtaining ABET accreditation for their new program. This is a duty rarely put on the shoulders of an untenured professor but an extremely important requirement for the future success of the department. In this case the young faculty member sought mentorship and help from other department heads who had successfully passed prior ABET inspections. The faculty also communicated with the College's Dean to ensure the level of time commitment required for the activity was understood and accounted for appropriately.

Institutional Responsibilities Extreme Case 2: In another extreme case, high turnover in an engineering department led to an untenured faculty member sitting on a search committee every year of their career to date. Search committees can be very time demanding due to required training courses, reviewing applications, phone interviews and on-campus interviews. Applications for tenure-track positions are often in the hundreds. Reviewing the applications is a tremendously slow process, taking several days to complete. Typically an untenured faculty is kept off search committees as much as possible, however in this case it was impossible. Several techniques were employed to increase the efficiency of reviewing applications, such as reviewing the cover letter and rejecting applicants who provided blanket statements indicating a lack of awareness of the unique specificity of the university's needs. Another method was to speak to the chair of the search committee to arrange the timing of the hiring process such that

applicant reviews and phone interviews occurred during the winter break. This is a time that offers more flexibility because classes are not in session.

Institutional Responsibilities Extreme Case 3: In one department the student enrollment grew at a much higher rate than the number of full-time faculty. In order for engineering students to receive appropriate advising it was felt that they should have engineering faculty as advisors. Due to this, in their second year as a faculty member one professor wound up with 52 advisees (almost 3 times the university average), many of whom were freshman. Meeting with each advisee took a significant amount of time each semester and for the three weeks before registration the professor was either lecturing or advising with little time for any other professional responsibilities. In response the professor was able to have some advising included in the introduction to engineering class which now requires students to create a 4-year plan as a homework assignment. This reduced the amount of time each student needs during advising meetings. The professor also brought the issue up at department meetings and eventually the Dean agreed to hire some extra help for advising, thus reducing the number of students each faculty member advised.

The Good Stuff

It is important to make clear that the reality of being an engineering instructor also includes occasions and events which reaffirm one's passion for becoming a professor. These can sometimes be overshadowed or lost in the chaos of a semester and pursuit of continual improvement. These can also occur infrequently, however that just makes them more meaningful when they do. What follows are things which have thrilled the authors during their early years as professors:

- hearing a student say they are so excited about the topic that they want to go home and do more homework
- helping a student get into graduate school
- hearing a student say they loved the class and that it also was the hardest class they ever took
- getting a good teaching evaluation
- being thanked and shaking a student's hand as they turned in their final
- seeing a low performing student suddenly understand a difficult topic during office hours
- presenting a conference paper with students
- having the mother of an undergraduate research assistant thank you for seeing the potential in her child

Conclusion

The reality of being a professor includes much more than teaching, research and service. Anybody who gets the privilege to become an engineering instructor should expect the unexpected. The extreme cases presented here are a short selection of experiences from three

faculty who did not anticipate having to navigate such cases before they actually occurred. There is no doubt that most professors have many stories of their own. There are many aspects of the profession which add to its richness while simultaneously complicating the day-to-day. There are also many bright spots to the profession which make the journey a joy.

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