

Vince's Guide to EE at RIT

by Vince

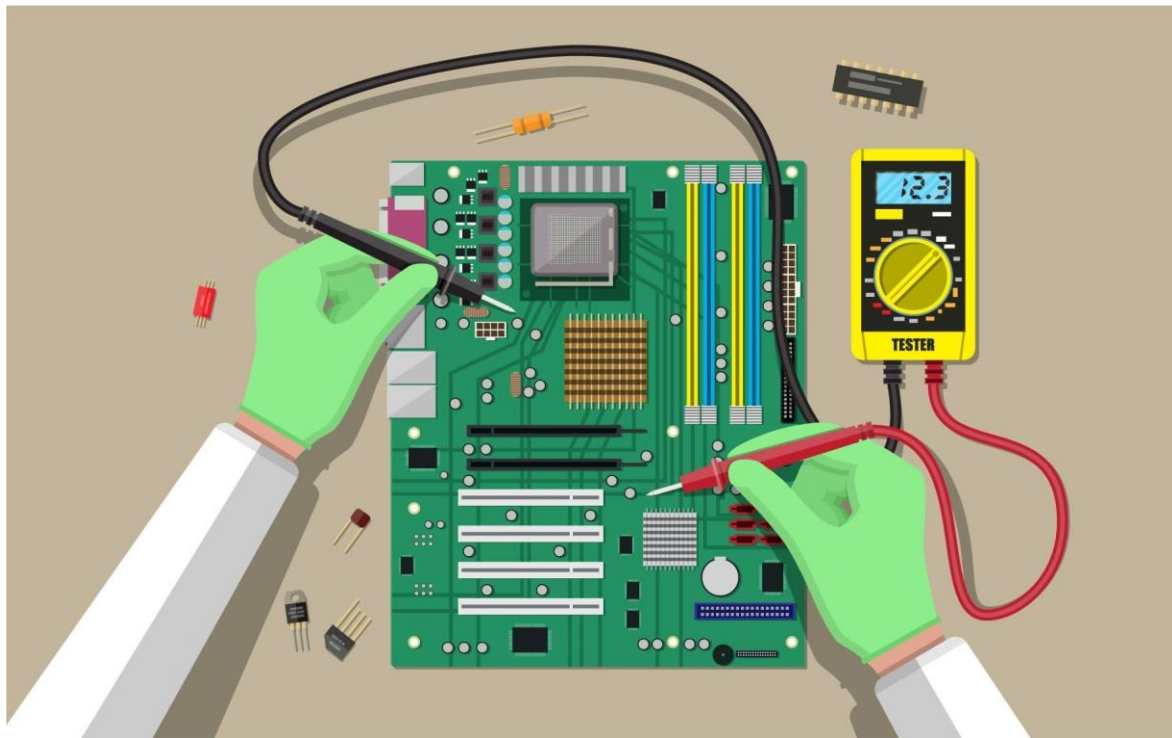


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Scope

I will be graduating in the upcoming weeks with a Bachelor of Science in Electrical Engineering (core). Over the last five years, I have gained a lot of technical knowledge, made numerous friends, grown physically and mentally stronger, found new passions, advanced my career, and realized I had a number of regrets. Most of these regrets started off with “I wish I knew about this earlier and had taken advantage of this”. As humans, we will always have regrets, but we can always work on trading up regrets. We can turn “I wish I did this” into “I wish I did this better, and I am glad that I did it.”

I didn’t know what I was doing when I started the Electrical Engineering program at RIT. Hopefully this guide will find future electrical engineering students at RIT and provide some advice or guidance to help them trade up regrets.

Introduction

Some sources such as the [U.S. Department of Education College Scorecard](#) and [College Factual](#) have information that say that 14% of students at RIT will leave after their first year and only 66% of students will graduate with their bachelor’s degree within six years. These statistics can be worrying if you use them to approximate your chance of success. This guide should help you face any odds.

Success is defined as the accomplishment of an aim or purpose. We all want to be successful in college and RIT, however success can look different to each of us. One student may have their goals set on winning trophies with the soccer team while another student is looking to just to pass all their classes and get a degree. It is important to identify what success means to you.

Being successful at something requires metrics to assess whether you have completed your goal. In this guide I will define some common goals, explain why they might be important to you, and establish metrics to track these goals. I believe that the majority of goals can be categorized into three main groups: academic success, financial success, and health (physical and mental) success.

Abbreviations:

AI – Artificial Intelligence

co-op – Cooperative Education

CSH – Computer Science House

EE – Electrical Engineering

EET – Electrical Engineering Technology

GPA – Grade Point Average

KGCOE – Kate Gleason College of Engineering

RIT – Rochester Institute of Technology

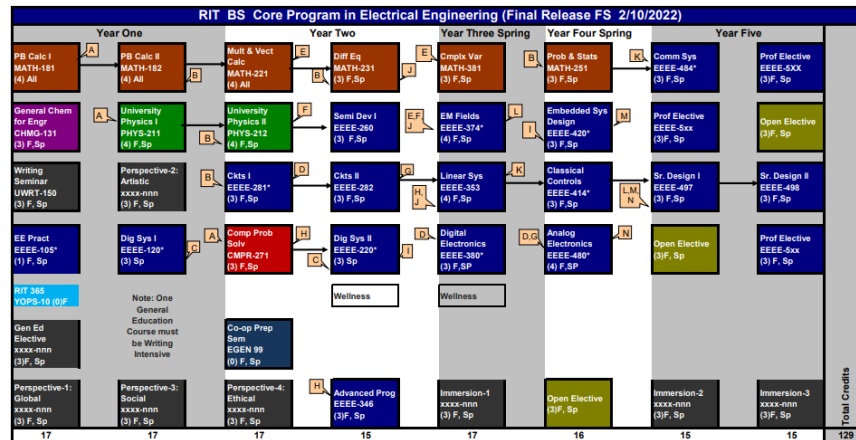
SLC – Hale-Andrews Student Life Center

Academic Success

Defining your goals for academic success is easier as a lot of the metrics are already created and tracked for you. These can include Grade Point Average (GPA), time to degree completion, transcript grades, and achievements. These metrics are important as other people can use these metrics as a way to judge you. Do not let this scare you. There will always be a company that will want you no matter what your academic goals are.

The EE program at RIT is set up for you to graduate in 5 years. The core bachelors program has 8 semesters of classes and four semesters of co-op (two summer semesters plus two regular school semesters (fall or spring)). The BS/MS program has 9 semesters of classes, a reduced co-op requirement, and you will receive a master's degree along with your bachelor's. This has a high value as you only pay tuition for one more semester and a lot of jobs will give you an automatic pay raise, but it comes with a tradeoff of a tougher course load. This is a goal that a few people take on.

Both the BS and the BS/MS programs have a couple different “options”. Choosing these options allows you to pursue a passion mainly sets your open electives to specific classes in a topic. Currently, there are options for people who are interested in: robotics, AI, renewable energy, and computer engineering. The EE department provides flowcharts that help visualize each of these and can be found at rit.edu/engineering/electrical-and-microelectronic-engineering/student-resources under Approved Courses and Reference Materials. The picture below shows an example of the BS Core program flowchart.



Planning early on is great, but it is not necessary to set your goals on any of the options or BS/MS programs right away. Comparing the flowcharts will show that classes only start to differ around your 3rd or 4th year so deciding on a path can be done during your second year.

Choosing classes can be tough as they can have multiple sections and conflicting class times. The Computer Science House (CSH) created an extremely useful tool found at <https://schedule.csh.rit.edu/> that will help plan your class schedule. It uses the different sections available and shows every valid possible combination of classes. As a freshman, you have the lowest priority when enrolling so prepare backup classes in case a class that you were planning on fills up.

General class advice:

Some classes will present a direct challenge your academic goals. However, there are numerous resources that are aimed at helping you be successful.

First Year: Your first semester classes will be picked for you by your advisor. Your chosen schedule is not set in stone yet, but you only have a limited amount of time. After about 1.5 weeks (this is called the add/drop period), you will not be able to enroll or swap in new classes. After the add/drop period ends, your transcript will include any other classes you drop. In my first semester, my advisor enrolled me in Archaeology and the Human Past to fulfill a general education (gen-ed) class. I hated it. It was not a great class for me and I didn't understand the significance of the add/drop period, so I was forced to sit through it all semester.

The starting electrical Engineering classes can be easy. In freshman practicum, you will learn the basic circuit elements and complete some small bread boarding projects. In Digital Systems I, you will learn how logic gates work and how to simulate them. I think that it has average difficulty level and it mainly requires time and effort. Learning some of these concepts is very important as they provide a base that will be used in your upcoming years. During freshman year is where some students will start thinking about switching majors, transferring schools, or dropping out. If you believe Electrical Engineering is not for you, talk to your advisor to find the best path for you.

Second Year: While your first year mostly will consist of mostly gen ed and perspective classes, your second year will focus mostly on EE and math classes: Circuits I (DC circuit analysis), Circuits II (AC circuit analysis), Digital Systems II (Verilog/VHDL), Intro to Semi Dev (semiconductor physics), Advanced Programming (C++). This semester has the highest number of dropouts from the program. These classes generally have bigger class sizes and are very structured. Each grade will be explained and tracked for you.

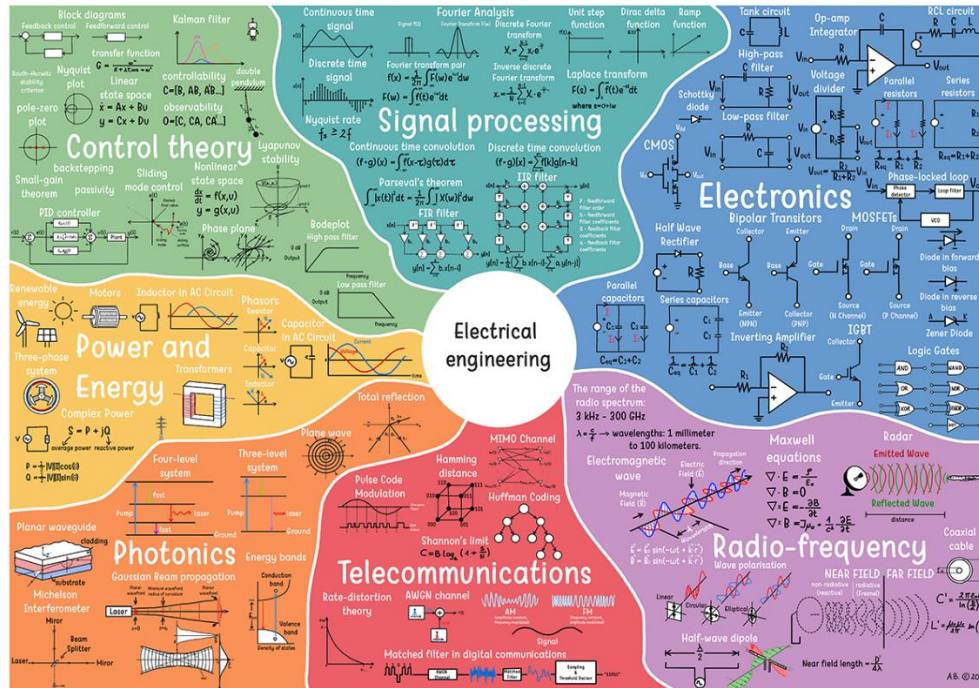
I personally struggled with time management the most during this year. I got back on track by regularly setting time aside to manage a to-do list. I used Google Keep (keep.google.com) as it is quick, is very cross-platform friendly, and has minimalistic design.

Third Year: Classes will start to get more varied based on what program and options you are in. Some of the notable classes are EM Fields, Linear Systems, and Digital Electronics. This is also when you will need to start looking for your first co-op. There are many applications of Electrical Engineering Through your co-op, you will hopefully get to see some of the different things an electrical engineer could be paid to do. My advice for your time on co-op is to become friendly with as many people as possible and keep a list of the different things that you were paid to do.

Co-op is a great time to start thinking about what electrical engineering specialties appeal to you and which ones are not your flavor. The Electrical Engineering program at RIT is set up to give you the basics of and enable you to get started in:

- Communications
- Computer
- Power Systems
- Electromechanical Systems
- Electronic Systems
- Software
- Instrumentation
- Photonics
- Sensor
- Signal Processing

This poster shows some of the basic math and physics laws that form the basis of different subfields of electrical engineering.



Fourth year: During this year you will take Embedded Systems Design, Classical Controls, and Analog Electronics. Students tend to struggle with these classes as they heavily use concepts from previous classes and builds upon them. Definitely reach out to your professor and utilize academic resources right away if you are struggling in the beginning of the semester. However, I feel that these classes have a steep learning curve meaning that it will get exponentially easier if time is set aside to understand the basics.

Fifth year: There is a lot more freedom in choosing your classes this year. While Communication Systems is an easier course, some of the professional electives are tough. This year you will do senior design as well. In the month before senior design starts, you will be emailed a survey to find which projects you are interested in. I would recommend choosing either an easy project or a project where you can develop your skills in a specialization.

Resources that are Human

Your professors can be a great resource. Make use of their office hours if you are struggling with the concepts in their class. They would love to see you do good on their tests and homework. While some professors won't notice if you do not go to their lectures, they will not care if you are working hard to teach yourself and doing well.

I have heard stories of bad interactions with professors. However, in my opinion, the professors in the Electrical Engineering department are really helpful and decently friendly. If you run into problems with a professor, always communicate with your advisor and the department.

Teaching Assistants (TAs) are another amazing resource. They are also undergrad students, so they have gone through the same things you have. They understand the struggle with lab documentation and know how to solve most issues. Most of them will get annoyed if they feel that they are doing the lab for you when there are other students that are asking for help. During the day, there will be some TAs hanging out in the TA office (located in the middle of the square on 3rd floor KGCoe) where you can walk in and ask them for any help.

Your peers are your greatest resource. Collaboration is key. Engineers in the professional field google things and ask their coworkers for help all the time. I noticed that most students are highly motivated by mutual benefit. I was successful academically at RIT mainly because of collaboration with my peers. They helped me because I helped them when I could.

Cheating:

Cheating is not recommended. It can severely impact your academic goals. If you are tempted to cheat on something, understand that is only for X% of your grade and review all other options such as asking the professor for an extension or just losing that X%.

Health Success

I believe that actively creating health goals is important. It is easy to get swept up and bogged down by pursuing financial and academic goals. Creating and achieving your health goals makes it easier to achieve other goals.

I love to play soccer, so I set goals to getting better. I spent a lot of time in the SLC and on the turf field practicing, playing intramurals and pickup games. These two resources allowed me to get involved with intramurals and helped me reserve spaces to organize soccer games (<https://recreation.rit.edu/> and <https://reserve.rit.edu/>).

Mental health is just as important as physical health. If you are lacking, it can negatively impact your experiences and goals. Set a goal to talk to new people, get out of your dorm room, or eat a little healthier than you did last week.

When I get overwhelmed by the amount of things I have to do and my mental health is suffering, I start by planning 1 hour where I plan the next 3 days including my downtime.

Financial Success

Goals in this category can vary a lot from person to person as we all come from different backgrounds. Attending a university is a full-time investment. RIT reports base tuition for a new full-time undergraduate to be \$53,720 and the U.S. Department of Education claims that the average annual cost is \$33,167. Most likely, you are actively paying money to be there. Use as many resources as possible to make your return on investment (ROI) positive.

Plan for tuition to be raised every year. Some statistics and past data on the cost of tuition over the years can be found at educationdata.org/college-tuition-inflation-rate and ritpedia.rit.edu/mediawiki/index.php/Tuition. To counter the yearly rise, you can still earn new scholarships and reduce your tuition every year. This requires time set aside to researching and filling out applications.

Some students choose to pursue a job. Try not to let low paying jobs compromise any academic or health goals. In my experience, the most coveted jobs on campus are at the Wallace Library and TA positions.

Conclusion

Goals can often conflict with one another. Pursuing health goals might take up time that you would have otherwise used for academic goals or vice versa. Learn as much as you can, make numerous friends, grow physically and mentally stronger, find new passions, advance your career, and trade up regrets. Find your ideal version of success. Through RIT and the internet, there are countless resources that you can utilize to effectively set and attain goals that will help you be successful at getting your EE degree at RIT.

Useful Links

RIT has hundreds of webpages. Trying to navigate to a specific resource might be tough so I compiled a list of some of the most used ones in my experience:

RIT based:

rit.edu/engineering/electrical-and-microelectronic-engineering/student-resources: This webpage has information on academic advising, tutoring & mentoring for electrical and microelectronic students, and it has a link to the [KGC OE Undergraduate Student Handbook](#) which is important to read at least once. The undergraduate student guide contains a useful explanation of all the requirements to graduate. As discussed previously, you can find the flowcharts for each of the electrical engineering options under the Approved Courses and Reference Materials section of the site.

rit.edu/myrit/home: Through this site, you can easily access your UID and links to a lot of other resources.

mycourses.rit.edu/: This is a universal portal to your classes and the content that professors want to share with you.

rit.edu/infocenter/: This site has links to SIS and eServices.

campus.ps.rit.edu/: Student Information System (SIS) is very important. It allows you to enroll in classes, check your grades, graduation requirements, and schedule appointments with your advisor.

rit.edu/eservices: Here you can manage your tuition payments and scholarships.

schedule.csh.rit.edu/: Developed by the Computer Science House, this tool helps you plan your classes for each semester.

rit-csm.symplicity.com/students/index.php: CareerConnect is a job board site for RIT students. This is super useful for connecting with companies.

rit.edu/calendar: Here you can find an overview of academic dates.

start.rit.edu/: This is where you can manage your RIT account and register your devices to access the internet over ethernet on campus.

tigerspend.rit.edu/: You can manage your Tiger Bucks and Dining Dollars through this site.

rit.edu/careerservices/: This site contains useful information and resources for co-op, on-campus employment, and career workshops and programs.

myaccess.rit.edu/: Students can request interpreting services through this site.

campusgroups.rit.edu/: Hundreds of events are posted here. This is a great place to find fun activities to do. This site also allows you to connect with student clubs and organizations.

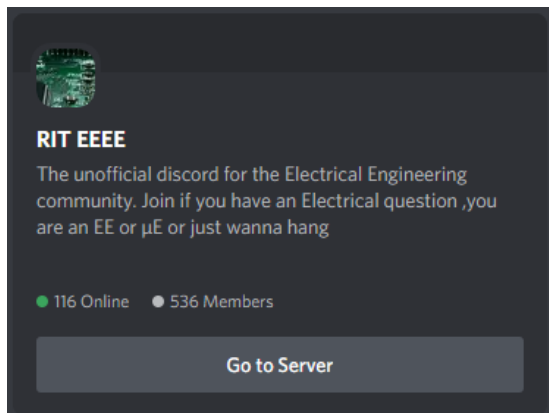
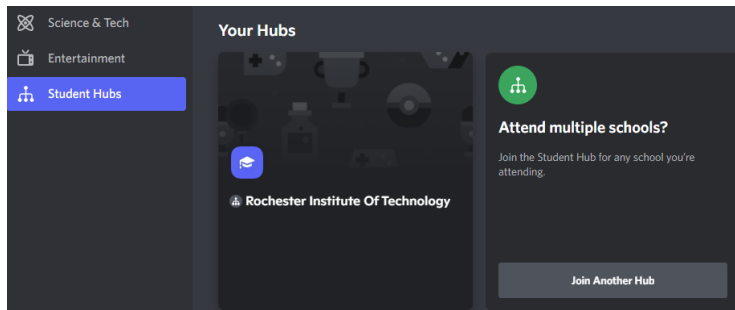
maps.rit.edu: This is very useful for navigating around campus. It has an interactive map of campus and can provide directions to the right building. It also has locations of water fountains, Kronos time clocks, parking reminders, and bus stops.

tigercenter.rit.edu/: Here you can find your weekly schedule.

rit.edu/events/: RIT faculty and staff can use this site to promote their events.

Other:

discord.com: Discord created Student Hubs which allows you to connect with public RIT servers by entering your student email. I would highly recommend joining the RIT Electrical Engineering server. There is almost always someone who is willing to help with homework, co-op/career questions, or class enrollment. There is also a plethora of EE memes.



reddit.com/r/rit/: This is a great place to connect with other members of the RIT community.

I personally use Google Keep and Google Calendar, and Google products and services heavily.