

2024/2025 RSGC ACES Program

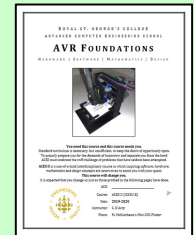
The ACES program was initiated in 2003 to address RSGC's moral obligation to develop each Georgian's unique talent set within the multidisciplinary hardware, software, design and technical writing domains. Our philosophy is based on the confidence that these assets bolster the quality of one's life through the cultivation of deep thinking and problem-solving skills. Our current physical space hosts a hands-on technical curriculum in the form of a sequence of three courses designed to prepare design and engineering-minded Georgians for the future that we envision. Please tour our website to explore the past and present manifestations of our philosophy.



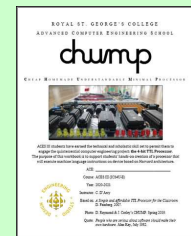
ICD20-E — DC Circuits (10) This hands-on course builds on the Science 9 introduction to Electricity. Students work their way through concepts in analog and digital circuitry employing curriculum designed specifically for our RSGC ACES program. Topics include reading schematics, prototyping, semiconductors, integrated circuits, microcontrollers, programming as well as safety, environmental, and societal awareness and trends. This course provides the foundation for our subsequent **ICS3U-E AVR Foundations** course. Detailed reports on projects develop strong technical writing and formatting skills.



ICS3U-E — AVR Foundations (11) Students are introduced to the architecture and implementation of microcontroller applications using the AVR family of microcontrollers. Topics include analog and digital concepts including the binary number system, ADC and DAC, PWM and interrupts. Printed Circuit Board layout and CAD/CAM skills are introduced enabling complete prototyping of projects based on light, sound, temperature, distance, mechanics, pressure, and power. Detailed reports on projects maintain strong technical writing and formatting skills.



ICS4U-E — AVR Optimization (12) **ICS3U-E graduates** are now prepared to explore the deepest level computer architecture from a 4-bit TTL-based processor to 8-bit AVR microcontrollers. Only through the knowledge, skill, and application of assembly language instructions can these devices be truly optimized for performance. Additional digital design topics include combinational and sequential circuits, K-Maps, latches, and flip-flops. In addition to common core curriculum, students undertake three Independent Study Projects (ISPs) on areas of interest to *them*, thereby affirming and solidifying their individual passions and skill sets enabling them to make well-informed, university-related decisions.



University Placement in Computer, Electrical, Mechanical or Software Engineering

A Final Reflection from a 2023/2024 ACES Graduate

And so comes an end to the most incredible high-school academic experience anyone in Ontario could ever ask for. I legitimately cannot explain how much hardware has changed who I am over the past two and a half years. I have become resilient, learned to bounce back, learned to push forward, and learned how to paint a new finish line and cross it. I've learned about my strengths and areas of improvement, and what I can do better in my work. I learn from my past projects and their successes and setbacks, and use the material I've grown experienced with to expand on the next horizon.

There's far too many things I could say about hardware than I can fit into a single reflection. It's the only course where you always know how you stand, and how you can improve. It's the only course where you always have a universal base of support from your fellow ACES. It's the only course where you can really tailor your experience to your hopes and aspirations. While the curriculum projects set you up with the foundation of the course material, your ISP comes as difficult as you decide to make it and tailors itself to your engineering aspirations.

As much as my DER is a textbook or a portfolio, it's also a reflection. Each project has one, and it's in my own words. It shows me what I think about each project, and how I've learned about myself more than the assignment at hand. It contains the effort and the struggle put in to make this report the best piece of writing I take away from high school, and it's the reason I'm up at 11:37 PM just sitting here, writing, writing, writing. While most of my high school papers are going to be recycled by my parents, this will stay with me forever.

As much as the DES is my classroom, it's essentially become a second home for me and my stuff. I've spent several long hours in that room, past when everyone else has gone home, past when the sun sets, past when the PCB is done but the coding needs a touch-up. There's no other classroom in the whole school where I would just willingly sit and work, because the DES directs you to every resource you would ever need in order to succeed. It all depends on how you use it.

Next, as much as I was once an aspiring ACE under the guidance of Jasper S. (ACES '18) and Jared D. (ACES '22), I was also under the guidance of my classmates, and even younger ACES. In return, I was always a resource for them, helping them figure out coding issues and wiring complexions. Though there were much fewer TAs this year than in previous years, I can only credit the 10s knowing all my TA days to having done a good job working with them. They learned as much from me as I did from them, understanding their risks, ambitions, and goals for their engineering passions.

I'm not done with hardware. There will be a new report. Maybe even in this document. It will be either under the header NE100 or APSC100. Here's to the next big journey.

I cannot thank you enough, Mr. D'Arcy. You have set me up in the best way possible for university, and any of the random tasks that are thrown at me. You've taught me to be adaptive, to problem solve, and to recover from setbacks. You've taught me to understand my mistakes instead of avoid them. You've taught me time management. The list goes on. But most importantly, you have taught me how I am in control. Hardware put me in the driver's seat. When I started, I couldn't drive two feet without stalling. Now, I'm driving all the way out to university knowing that no matter what difficult situation I find myself in, there is a solution if you make room for one, pave a path to it, and succeed. Thank you sir, I never would have gotten where I am now if we hadn't crossed paths.