Teaching Philosophy

Inspiration: Growing up in the presence of my father, a dedicated teacher, profoundly influenced my educational philosophy. He was a masterful guide who fueled my passion for learning by posing thought-provoking questions, stimulating my curiosity and shaping my approach to critical thinking. Instead of providing direct answers, he encouraged me to explore and discover solutions independently. This formative experience became the bedrock of my teaching philosophy, emphasizing the important role of critical thinking in education. My aim is to gradually but firmly establish curiosity and foster creativity, ultimately transforming students into innovative and knowledgeable individuals.

Inquiry: I believe the most effective way to engage students is through inquiry-based learning. Students are more likely to embrace a new concept when they perceive it as a solution to a problem in their minds. The approach involves initiating the class with well-chosen questions and allowing students to explore the topic with guidance from the teacher. In this method, I express the fundamental problem, instill a desire to find the answer, and facilitate class discussions. My role is that of a moderator leading students through a challenging experience designed to promote discussion, critical thinking, and discovery. For instance, when starting Digital Logic Design at the beginning of the semester and discussing number systems, I began with the question, "Why is the decimal system predominant, and not, for instance, octal or hexadecimal?" After discussing this, I posed the next question, "Now, why do machines use the binary number system?" I noticed more students engaged in answering the second question when the first question was discussed beforehand, compared to classes where I directly presented the second question. This method also fosters a conceptual understanding of problems and solutions in electrical engineering, enabling students to connect different concepts and apply engineering methods creatively.

A Deep Understanding: A successful teaching method involves a combination of various techniques. Another technique I find particularly useful is cognitive learning, where the focus is on understanding the subject at a deeper level rather than memorizing approaches to specific problems. My approach to this process includes three elements: first, students need to understand why they are learning the subject; second, they should gain knowledge about the subject at a deep level; and third, they should contemplate the application of what they learned. Course contents should be designed to ensure students acquire a deep understanding and develop the skills to apply their knowledge in their field. For example, when presenting logical operations (AND, OR, and NOT) in a Digital Logic Design class, I explained the concept of an idealized switch network, gave simple examples, and asked students to identify different combinations and create separate components. Subsequently, I introduced Boolean algebra and logical operations as tools to analyze and design circuits algebraically in terms of logic gates.

Creativity: Arguably the most crucial aspect of learning, especially at the highest level, is creativity. The scientific approach to creativity involves studying and mastering existing achievements, asking questions, proposing solutions, designing experiments to validate proposed solutions, and communicating research with other scientists to receive feedback. My plan to involve graduate and last-year undergraduate students in research includes providing them with sufficient background and knowledge in a specific area I believe has research potential. I will ask them to identify and compile a list of new and noteworthy works published

in the subject. Subsequently, they will write briefs on those papers, highlighting their contributions. The next step involves presenting the papers to deepen their understanding of the works. I firmly believe that explaining something to someone else enhances insight into the topic. Therefore, such conferences will be a fundamental part of my approach, helping students evaluate literature and communicate their findings. The subsequent phase will include a critical analysis of the papers, requiring students to consider the weaknesses, limitations, and drawbacks of proposed approaches. Conducting simulations to replicate and test findings from the papers will help them learn necessary tools and approaches, facilitating problem-spotting.

At each phase, it is my responsibility as a teacher to evaluate their work, provide feedback, and offer suggestions for improvement. This process allows students to enhance their ability to identify problems, review literature for solutions, propose new solutions, and effectively communicate their research.

In summary, I aspire to impart the qualities that meant the most to me during my education: inquiry, deep understanding, and creativity. I aim to instill a love for engineering in my students, as I personally feel an infinite passion for it

Teaching Interests

In my previous teaching roles, I found great joy in breaking down complex ideas and creating an environment where students can comfortably engage with the material. These experiences have solidified my commitment to pursuing a long-term career in teaching.

My love for transferring knowledge aligns with my interest in developing course materials and teaching in areas such as digital logic design, computer architecture, embedded systems, system-on-chip, and microprocessor-based systems. In particular, courses such as Introduction to Digital Systems, Introduction to Computer Organization and Architecture, Computer Organization, Computer Systems Design, Microprocessor Systems. Having taught courses like Computer Architecture and Digital Systems, and with industry experience focusing on embedded systems and logic design, I feel prepared to offer a new perspective based on industry applications.

I would enjoy teaching courses related to cybersecurity and cryptography as well. Currently, I teach Cybersecurity I and Cybersecurity II at the University of Windsor's Department of Continuing Education. These courses cover a range of topics, including social engineering hacking techniques, network attacks, data protection, secure protocols, cryptographic algorithms, authentication methods, and wireless network security. My research in cryptography, particularly in post-quantum algorithms and homomorphic encryption, further enriches my ability to provide relevant and up-to-date instruction.

The other topic that I am interested in teaching is artificial intelligence (AI), with a Ph.D. thesis centered on AI and and published several research papers. I have also mentored Master and PhD students in AI thesis and am eager to develop course materials for subjects such as Artificial Intelligence and Neural Networks, leveraging both my research and practical experiences.

Moreover, I have experience in networking as I worked as digital logic designer for a L2 switch for the past two years. I am interested in teaching Computer Networks courses that cover topics Networking Fundamentals, Routing and Switching, Basics of Transmission Systems an network architecture. I am also interested in teaching courses related to signal processing and Digital Signal Processing. Furthermore, I have experience and interested in teaching courses relate to electronics such electronics I and II and digital electronics and cover topics transistors, diodes, op Amps, amplifier design, gate design , analysis power dissaption and delay.

In summary, I am eager to contribute to Carleton University through my diverse background and passion for education. My past teaching experiences, coupled with my academic and research foundation as well as industry experience, put me in a good position to become dedicated educator.

Teaching Experience

Instructor, Contniue Eduation, University of Windsor, ON, Canada. *2023-Present*

- Teaching Cybersecurity I : Introduction to Systems Security and Cybersecurity II: System Implementation in the department of continue education in University of Windsor. This courses are offered remotely where students learned about different types of cyber attacks and how to secure computers, networks and servers. Course materials, attendance and quizzes and grading are done int he Brightspcae.

Mentor, University of Windsor, ON, Canada. *2020-Present*

- Closely supervising and mentoring two PhD and three master students on weekly meeting basis. Helping them to gain fundamental knowledge, identifying problems, literature survey for solutions, and critical analysis of published works. Both PhD students managed to publish IEEE transaction papers in their second year of PhD and have more papers in review and preparation. Master students are performing research experiments at the moment. As a mentor, I provided guidance and evaluated progress of an undergraduate student to finish his project.

Graduate Teaching Assistant, University of Windsor, ON, Canada. *2018-2020*

- Prepared materials, tutorials and answered student questions as a teaching assistant. During labs, I helped students to formulate their ideas to flowcharts and further to codes to implement on FPGA, Arduino or Raspberry Pi evaluation boards and eventually debugging it.

Courses: Digital Logic Design II (DLDII), Embedded Systems and Electronics I

Lecturer, Islamic Azad University, Kermanshah, Iran. *2014-2018*

- Delivered lectures, designed, prepared and developed courses and teaching materials and assessed students. Supervised research activities of students including final year undergraduate projects.

Courses: Digital Logic Design, Computer Architecture and Analog CMOS Integrated Circuits, Electronics.

High School Teacher, Chamran High School, Eslamabad Gharb, Iran. *2009-2010*

- Designed courses, instructed and evaluated students, worked with weaker students in individual, graded exams and communicated with parents about students progress.

Courses: Electronics, Electronics Measurements.

Teaching Methodology

As an enthusiastic educator, my teaching methodology centers on creating a dynamic and interactive learning environment that empowers students to actively participate in their educational journey. Through a combination of traditional and modern approaches, I aim to cultivate critical thinking, communication skills, and a deep understanding of the subject matter.

- **Lecture by Teacher:** Engaging and informative lectures will form the foundation of the course, providing a comprehensive overview of key concepts and theories. Lectures would be enriched by utilizing multimedia resources, real-world examples, and case studies to enhance the learning experience.

- **Oral Questions by Teacher Answered Orally by Students:** I aim to actively ask questions to encourage students to understand the need to learn the topic and participate in discovering the solution to the problem that course address. This approach promotes critical thinking, reinforcing key concepts and fostering a collaborative learning atmosphere.

- **Class Discussion Conducted by Teacher:** Facilitating lively class discussions to encourage students to express their opinions, ask questions, and engage in critical analysis. Incorporating diverse perspectives to enrich the learning experience and promote a deeper understanding of the subject matter.

- **Presentations by Student Panels from the Class:** I am planning to incorporate student presentations in my courses, providing opportunities for them to develop research and communication skills. This approach not only encourages teamwork but also allows students to take ownership of their learning.

- **Reading Assignments in Academic Journals:** Assigning relevant readings from academic journals to deepen theoretical knowledge. Emphasizing the importance of staying current with scholarly literature and developing the ability to critically evaluate research.

- **Reading Assignments Related to Topic with Application in Industry:** I am planning to give reading assignment about application of course topics in the industry. The objective here is to explore real-world implications and connections between academic knowledge and industry practices.

In summary, by incorporating lectures, questions, discussions, student presentations, and a balance of academic and industry-related readings, I seek to equip students with a depp understanding of the subject, preparing them for success in both academic and professional pursuits.