Title (Course Number): Innovating and Accelerating Solutions for Special Projects (ECE 592-121)

Catalog: Application of engineering, scientific, and technology commercialization principles to design, develop and prototype solutions for Defense related problems faced by sponsors. Students will work in multi-disciplinary teams over two consecutive semesters to understand customer needs, create a prototype and develop a scaling up plan to solve the problem. *Dept. and Instructor approval required.*

Credits: 3 per semester (Fall and Spring)

Teams: 4-5 students; multi-disciplinary; graduate students from COE and COS.

Enrolment limit: 30 students. US Citizenship not required.

Semester 1 (Fall):

- Select project from offered list of problems related to Advanced Development for Defense
- Conduct customer development by talking to sponsor teams and other non-sponsor customers
- Design their prototype and conduct preliminary research to establish proof of concept
- Perform feasibility analysis

Semester 2 (Spring):

- Build prototype and get it tested by the sponsors,
- Create a scaling and operations plan, and
- Establish financial viability for their solution.
- Present their solution in the form of design poster and working prototype to the sponsors from Department of War and other stakeholders.

Link to express interest in registering: https://forms.gle/nccTUYhnSZp6VG9X8

Example Projects:

- Develop a universal, "plug-and-play"; system that can integrate data from various CBRN sensors into a single, easy-to-understand display. The system must be platform-agnostic (usable on drones, robots, or vehicles) and prioritize small size, weight, and power (SWaP)
- Design a creative, high-performance material that repels both water and oil-based chemical agents without using any PFAS "forever chemicals". Your solution should be a safe and effective alternative to current protective gear.
- Current filters have not seen significant innovation in decades. Your challenge is to create a novel filter that not only captures and neutralizes harmful agents but also includes a clear indicator to show when it's time for a replacement.
- Create a lightweight, portable device that can detect and identify biological threats from a safe distance. This handheld detector should be easy to operate and provide real-time alerts to protect personnel from unseen dangers
- Develop a pair of goggles that uses hyperspectral imaging (HSI) to allow the wearer to "see" and identify chemical and biological threats in their environment. The goal is to provide immediate, visual information about invisible hazards.