<u>Workshop on Career Topics from Fall 2024 ELC Meeting:</u>

* = multiple people agreed with the idea

Future Skills and Training Needs: Employers can discuss what skills and knowledge will be essential for the next generation of engineers.

- AI Prompt Engineering **
    - CS 4890/5890: Computational Linguistics
    - CS 5720: Design and Analysis of Algorithms
    - CS 4435/5435 and DASE 4435 Data Mining
- Interpreting data and making the connection to physical phenomena
    - CS4985/5985 Cybersecurity Metrics
- Critical thinking in the use of AI ***
    - CS 5720: Design and Analysis of Algorithms
    - CS 4080/5080: Advanced Algorithm Analysis
    - CS 4435/5435 and DASE 4435 Data Mining
    - ECE 5220 Deep Learning
- Computational methods **
    - CS 4610/5610: Applied Convex Optimization
    - CS 3850 Bioinformatics & Computational Biology
    - CS 4435/5435 and DASE 4435 Data Mining
- Use of estimation *
- Cyber mission systems engineering (NIST SPP800-160vlrl, OSD SCRE, CRWS-BoK)
    - CS3920 Introduction to Defensive Cyber Operations
    - CS4915/5915 Defensive Cyber Operations
- People skills, teamwork, problem solving, operating in a hybrid environment, and remote *
    - CS 4080/5080: Advanced Algorithm Analysis
    - CS3920 Introduction to Defensive Cyber Operations
    - CS4915/5915 Defensive Cyber Operations
- Model based systems engineering *
    - CS4985/5985 Cybersecurity Metrics
    - CS 4730/5730: Algorithmic Game Theory and Multiagent Systems
- Cloud based engineering + business + edge
- Ability to make decisions without all the data *
    - CS4985/5985 Cybersecurity Metrics
- Secure SW development and maintenance
- Return to fundamentals *
    - CS 5720: Design and Analysis of Algorithms
    - CS4985/5985 Cybersecurity Metrics
    - CS 4920 Cryptography
    - CS 5920 Advanced Cryptography
- Sustainability
- AR/VR (apple vision pro)
    - CS 4800/5800: Introduction to 3D Computer Graphics Techniques
    - CS 4770/5770: 3D Animation and Visualization
    - CS 4790/5790: Wearable Computing and Complex Systems
    - CS 6770: HCI and VR
    - CS 5810: Advanced Computer Graphics and Advanced Techniques

  - CS 4780/5780: Advanced 3D Games and XR Technologies
  - CS 5750: Computational Geometry
- Data science
  - CS4985/5985 Cybersecurity Metrics
- Michael Sayors framework for 2 layers of security with bitcoin

Adapting to Rapid Technological Changes: Talk about how companies are adapting to rapid technological advancements and what this means for their workforce.

- Renewable energy impacts, nuclear microgrids, energy storage *
  - ECE 5750 Renewable Energy and Distributed Systems
  - ECE 5710 Lithium Ion Battery modeling
- Transistor size advancement **
  - ECE 4210/5210 Rapid Prototyping with FPGAs
  - ECE 5990: Nanoscale Devices.
- Transportable/mobile missions, connectivity + power = secure, human factors
  - CS 4740/5740: Networks, Crowds, and Markets
  - CS3920 Introduction to Defensive Cyber Operations
  - CS4915/5915 Defensive Cyber Operations
  - CS4985/5985 Cybersecurity Metrics
  - CS 4730/5730: Algorithmic Game Theory and Multiagent Systems
- Cyber requirements
  - CS3920 Introduction to Defensive Cyber Operations
  - CS4915/5915 Defensive Cyber Operations
  - CS4985/5985 Cybersecurity Metrics
  - CS 4920 Cryptography
  - CS 5920 Advanced Cryptography
  - CS 4910 Introduction to Computer Security
- Limited growth in "core" capabilities – EE, power
  - ECE 4210/5210 Rapid Prototyping with FPGAs
  - ECE 5990: Nanoscale Devices.
- Migration of legacy NW/SW systems into modern architecture
- Generative AI
  - CS 4890/5890: Computational Linguistics
  - CS 4860/5860: Machine Learning
  - CS 4870/5870: Neural Networks
  - ECE 5220 Deep Learning
- LLM (AI) *
  - CS 4890/5890: Computational Linguistics
  - CS 4860/5860: Machine Learning
  - CS 4870/5870: Neural Networks
  - CS 4435/5435 and DASE 4435 Data Mining
- Block chain
  - CS 4920 Cryptography
  - CS 5920 Advanced Cryptography
- Quantum communications *
  - ECE 5990 Special topics: Quantum Computing
- Digital engineering
  - CS4985/5985 Cybersecurity Metrics

- System engineering, systems of system engineering (holistic)
    - CS3920 Introduction to Defensive Cyber Operations
    - CS4915/5915 Defensive Cyber Operations
    - CS4985/5985 Cybersecurity Metrics
    - CS 4730/5730: Algorithmic Game Theory and Multiagent Systems
- Bring back math into engineering, keeping core Eng/math principles *
    - CS 2150: Discrete Structures
    - CS 5720: Design and Analysis of Algorithms
    - CS 4920 Cryptography
    - CS 5920 Advanced Cryptography
    - CS 4610/5610: Applied Convex Optimization
    - CS 4730/5730: Algorithmic Game Theory and Multiagent Systems
- Multidisciplinary projects
    - CS4985/5985 Cybersecurity Metrics
- Entrepreneurial mindset, prototyping *
    - C3 (curiosity, creativity, and community) Innovation Center on Campus
- Modern research techniques
    - CS 4740/5740: Networks, Crowds, and Markets
    - CS 4080/5080: Advanced Algorithm Analysis
    - CS 4890/5890: Computational Linguistics
    - CS 4860/5860: Machine Learning
    - CS 4870/5870: Neural Networks
    - CS 4610/5610: Applied Convex Optimization
    - CS 4730/5730: Algorithmic Game Theory and Multiagent Systems
    - CS 4435/5435 and DASE 4435 Data Mining

Industry Collaboration and Partnership Opportunities: Explore potential opportunities for industry collaboration between companies and UCCS.

Many of the opportunities mentioned in the Fall 2024 ELC Meeting, like online tech talks, guest speaker sessions, and workshops on emerging technologies, are already available. If you're interested, please reach out to Megan Mrkonjich to get an event set up and secure space. We value employer involvement and look forward to more opportunities to connect you with students.

- Mentorship online tech talks with companies and students*
- Guest speakers **
- Tech and tool workshops, new tech

Megan currently runs several soft skills workshops, including resume writing, networking, and Career Fair 101. As a team of one, her capacity is limited! Partnering with industry professionals helps expand these opportunities. If you'd like to lead a session on topics like communication, technical writing, or negotiation, she'd love to collaborate, just reach out!

- Soft skill workshops (communication, tech writing, speech, negotiation, Eng economics) **

Investing in UCCS students through capital partnerships, senior design projects, and robust scholarships directly shapes the future workforce. These investments provide hands-on experience, support education, and help UCCS recruit and retain top talent. Connect with Kyle Anderson to get involved.

- Capital investment partnerships

- Senior design projects *
- Investing in STEM as a joint project

Long-term internships are a great way to build a strong talent pipeline. If you sponsor a scholarship, you can include a long-term internship, co-op, or extended opportunity. Megan can help advertise these to students, though it's important to offer flexibility to accommodate their schedules. While some students face challenges balancing long-term internships with their course load and part-time jobs, many are still interested in the right opportunity!

- Invest in long term internship program

We'd love to arrange more site tours, especially with UCCS clubs. However, some clubs face financial constraints for transportation. If you're open to hosting a tour, we'll work together to find a solution. We're also interested in organizing site visits for professors and staff to build stronger connections

- Site tours for students with collaboration with UCCS clubs**
- Site visits for professor and staff *

Megan is not currently aware of which companies offer these opportunities. She would like to start by gathering a list of companies willing to participate. Having this list would be incredibly helpful when meeting with students who are interested in engineering but unsure of which specific area they want to pursue. Job shadowing can provide them with valuable insight into different roles within the field. Please let Megan know if you are interested!

- Professional job shadowing in industry

We're excited about the possibility of hosting hackathons with industry partners. For example, a company representative reached out to set up a 'Hackathon for Good' as part of her paid volunteer hours and wanted to collaborate with UCCS. We connected her with our cybersecurity program, and we are now working on establishing a date for the event. If other companies are interested in hosting or sponsoring a hackathon, we would love to explore those opportunities as well!

- Hack-athons *

For sponsored, competitive design opportunities that aren't long-term like senior design projects, consider Parker Dewey. This platform connects companies with students for short-term, paid projects (5-40 hours), with the company providing knowledge and mentoring. Reach out to Megan if you're interested in setting up a project through Parker Dewey.

- Sponsored, competitive design opportunities

See handout from Megan Mrkonjich – let her know if you need more.

- Inventory of UCCS resources for ELC to present to their buddies

We have a Master of Engineering in Engineering Management. However, undergraduate students don't have built in business courses, but they are allowed to take business electives.

- Provide business perspective, mini-MBA for engineering students

Enhancing Internship Programs and Supporting Student Research Projects: Talk about how companies can optimize their internship programs, covering key topics like creating impactful experiences, effective mentorship, evaluating success, and integrating interns into teams. Additionally, how can companies support students while they are working on research projects.

We’re excited to support you in creating impactful internship programs. While establishing the program itself is outside of our scope, we can connect you with best practices, valuable resources, and Megan is more than happy to offer feedback. For guidance, see the attached NACE (National Association of Colleges and Employers) best practices document, which provides helpful insights for developing strong internship programs. Additionally, we can assist in connecting you with students who are interested in internships that align with these opportunities. Feel free to reach out to Megan!

- Full year internship
- Use internship to answer “dumb” questions
- Immersive experiences to students
- Structured projects
- Exposure to multiple departments and disciplines
- Promote multi-interdisciplinary work
- Interact with multiple organizations
- Project has meaning *
- Rotate through departments*
- “Over challenging”
- Work on tools for use by other in dev *
- Leverage co-op (part time and summer semester)
- Provide employees with intern feedback, best practices and lessons learned
- Immerse with company team, real work, various mentors, and soft skill development *
- Community program with summer events to engage with other interns
- Housing exchange, rent out housing to student to intern