Students are to answer 1 of the 2 cases presented. See below for essay length and formatting requirements. Students can use any resource given in class or found online. Online resources should be evidence based from peer reviewed sources.

A 10-minute presentation of your process of finding relevant information for your essay will also be delivered with your exam. The presentation is not a summary of your paper, but a reflection on how you found relevant information and decided how to use it. The presentation can use any form of presentation (e.g. powerpoint) but needs to be delivered as a video file (.mp4).

Case 1: Designing a Human-Centered Visualization Tool for Cyber Situational Awareness

Security Operations Centers (SOCs) are responsible for monitoring, analyzing, and responding to cybersecurity threats in real time. However, SOC analysts often face overwhelming amounts of data, leading to cognitive overload, decision fatigue, and delayed responses to critical threats. The complexity of cybersecurity dashboards, excessive alerts, and poor information hierarchy can make it difficult for analysts to identify genuine threats efficiently. These challenges are compounded by human and psychological factors.

Your task is to develop a evidence based foundation for an for an eventual human-centered visualization tool that improves cyber threat recognition for SOC analysts. The tool would incorporate principles of cognitive ergonomics and behavioral science to enhance situational awareness. Consider human factor and psychological elements and discuss how interactive interfaces can support decision-making.

Endsley, M. R., & Jones, D. G. (2024). Situation Awareness Oriented Design: Review and Future Directions. *International Journal of Human–Computer Interaction*, *40*(7), 1487-1504.

Case 2:

Exam Task: Enhancing Communication in Cybersecurity Incident Response

A multinational corporation recently experienced a targeted social engineering attack that exploited weak communication between its cybersecurity team, senior management, and general employees. Although the IT security team detected the attack early, their warnings were not effectively conveyed to decision-makers, resulting in a slow and fragmented response. Misinterpretation of technical details, lack of clear reporting structures, and organizational silos delayed mitigation efforts, increasing the overall impact of the attack. This incident highlights the broader challenge of cross-sector communication in cybersecurity, where technical experts, executives, and non-technical staff must work together to manage and prevent threats. However, differences in expertise, risk perception, and communication styles often lead to breakdowns that weaken an organization's security posture.

Your task is to analyze the human-centered risks that contribute to failures in cybersecurity and propose strategies to mitigate these risks. Propose an evidence-based solutions that ensures proper cybersecurity response across all levels of an organization. Your response should consider research on human factors in security, crisis communication, and behavioral science to support your recommendations for enhancing cybersecurity resilience.

Pollini, A., Callari, T. C., Tedeschi, A., Ruscio, D., Save, L., Chiarugi, F., & Guerri, D. (2022). Leveraging human factors in cybersecurity: an integrated methodological approach. *Cognition, Technology & Work*, *24*(2), 371-390.

Formatting of Essay

The essay can be **3000 ± 10% words** in main body (abstract and references do not count) in 12-point Times New Roman font. Your essay should be typed and double-spaced on standard-sized paper (A4) with 1" margins (standard in Word Document) on all sides. Include a page header (also known as the "running head") at the top of every page. The running head is a shortened version of your paper's title and cannot exceed 50 characters including spacing and punctuation. Not meeting this requirement can result in a lower grade. Word count does not include pictures with no text. Tables will count towards the final word count. If pictures are used for tables, they will count as 500 words. The essay shall have a title page with Title and word count listed, abstract, main body, and references. This essay is an academic text.

See https://taltech.ee/en/formatting-guidelines for more information

For this essay, APA 7th is to be used (see: https://apastyle.apa.org/style-grammar-guidelines/references/examples)

Other resources for APA 7th (I personally use this one):
https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_style_introduction.html

Grading

See https://taltech.ee/en/grading-system for Taltech Grading policy

§ 14. Assessment of academic performance
(1) The methods and criteria of assessment defined in syllabus shall be available to students before the commencement of studies and they must not be changed during a semester. The assessment methods define the manner of attesting the acquisition of knowledge and skills (e.g. an oral or written examination, pass/fail assessment, an essay, a report, group work, a questionnaire). If various methods are used for the assessment of learning outcomes, their relevant weights in determining the final grade shall be specified in the syllabus. An assessment criterion shall specify the expected level and scope of knowledge which can be proved by the assessment methods.

(3) **In case of graded assessment, the achievement of learning outcomes is assessed based on the following scale**:
A (5) – "excellent" – outstanding and particularly profound achievement of learning outcomes, along with creativity and consummate proficiency in applying skills and knowledge;
B (4) – "very good" – very good achievement of learning outcomes, along with proficiency in applying skills and knowledge in a targeted and creative manner. Some details of knowledge and skills may exhibit errors which are neither substantive nor serious;
C (3) – "good" – good achievement of learning outcomes, along with proficiency in applying skills and knowledge in a relevant manner. A certain imprecision and uncertainty are apparent in the depth and detail of knowledge and skills;
D (2) – "satisfactory" – sufficient achievement of learning outcomes, along with application of knowledge and skills in a typical manner; in atypical situations both, uncertainty as well as lack of knowledge and skills are apparent.
E (1) – "poor" – minimum acceptable achievement of the most important learning outcomes along with limited application of knowledge and skills in typical situations; in atypical situations both, considerable uncertainty as well as lack of knowledge and skills are apparent;
F (0) – "failed" – achievement in knowledge and skills below the minimum standard.