

HFS301e Cognitive Systems Engineering

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

E-Learning: BLENDED - Learning is done MAINLY online using interactive study materials in Canvas. Students receive guidance and support from online instructors via discussion forums and emails. This is supplemented with SOME face-to-face sessions. If the course has an exam component, this will be administered on-campus.

Synopsis:

As technology advances, humans are required to work within complex systems environment with multiple interacting factors. Often decisions have to be made within compressed time and errors in decision making could lead to dire consequences. This course deals human performance within complex socio-technical systems, such as power plants or traffic control stations. Students will better appreciate how interacting variables in complex systems affect decision making and work performance. The focus is on describing and applying various tools for analyzing complex work environments as well as cognitive requirements of work to uncover the information required for making design decisions.

Topics:

- Cognition, Decision Making
- Situation Awareness, Crew Resource management, Stress coping and performance
- Cognitive tasks analysis, Principles of Human Centred Design
- Automation
- Fatigue Management, Shiftwork and Coping Strategies
- Managing Error in Complex Systems, HFACS

Learning Outcome:

- Discuss human cognition, human behaviour, decision making processes and ways to evaluate human performance.
- Illustrate how capabilities and limitations of human physiology and cognition affect performance.
- Examine the various methods for assessing cognitive work performance.
- Indicate how systems can be better designed through cognitive systems engineering principles.
- Propose how human performance can be improved through applications of cognitive engineering and good design principles.
- Evaluate factors that affect human performance and system safety and recommend better strategies of work.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
QUIZ	6

GROUP BASED ASSIGNMENT	18
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**