# AE 6551 - Syllabus

**Cognitive Engineering- 3 Credits**

## General Information

### Description

Cognitive engineering addresses a range of technologies and work environments that will support human cognitive performance, including information systems, decision support, automation, and intelligent systems.

### Pre- &/or Co-Requisites

None

### Course Goals and Learning Outcomes

Provide students with the knowledge and skills to:

(1) Understand how human performance impacts the performance of large-scale systems involving humans, technologies, and procedural/regulatory demands on behavior.
(2) Understand the fundamental determinants of human behavior within these systems, including their interaction with technological artifacts (such as computer displays and decision aids, information systems, and automated systems), context and situational factors, and their personal attributes and goals.
(3) Apply structured design methods to developing technologies (such as information systems) and procedures, in order to enable desired human behavior and system performance.
(4) Develop ability to critically review and discuss literature in the domain, connecting concepts and using precise terminology associated with cognitive Engineering.

## Course Requirements & Grading

**Note: Graded components of a course may vary with each offering. The example below is typical but subject to change.**

### Description of Graded Components

In support of each of these goals the following assignments are set. Each assignment will be assessed Satisfactory/No Credit, with descriptions of each given in an assignment specific rubric.

Mini-projects: (MP)

- Automation analysis using SRK & COCOM models
- Cognitive work analysis modeling building and procedure implementation
- Literature Report

Course Management Tasks (MT)

- Read assigned papers
- Answer discussion questions – bullet point format

- Watch video “answers” or clarification from instructor

Discussion Sessions – Small Group (DS)

- Participate in class discussion – sometimes whole class, sometimes in smaller groups.
- [Q section] – Submit Video Reflection assignments.
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**Grading Scale**

This course uses Specification Grading. To earn each letter grade you will need to satisfy the following:

| | A | B | C | D |
|---|---|---|---|---|
| Mini-projects (MPs) | See Individual Rubrics | See Individual Rubrics | See Individual Rubrics | See Individual Rubrics |
| Course MTs | **12** Weeks of Satisfactory Discussion Question Answers* | **10** Weeks of Satisfactory Discussion Question Answers* | **8** Weeks of Satisfactory Discussion Question Answers* | **6** Weeks of Satisfactory Discussion Question Answers* |
| (DS) Discussion | **12** Weeks of Satisfactory Discussion Participation* | **10** Weeks of Satisfactory Discussion Participation* | **8** Weeks of Satisfactory Discussion Participation* | **6** Weeks of Satisfactory Discussion Participation* |

## Topics Covered

**Note: The exact topics covered in a course may vary with each offering. The example below is typical but subject to change.**

- Designing to support human behavior
- What is cognitive engineering? What problem does it seek to answer?
- Different Patterns of Behavior: Skills, Rules & Knowledge
- Different Patterns of Behavior: COCOM and Fast-and-Frugal Behaviors
- Procedures, Hierarchical and Cognitive Task Analysis
- Situated behavior -- human behavior not just as a response to context & environment, but as a creator of context & manipulator of environment
- Structured methods for identifying and codifying important system dynamics
- Control task analysis – a model of what a human does in a cognitive task, perhaps?
- Translating some of our thoughts so far into design – specifically, Ecological Interface Design
- Decision Making in the Wild
- Decision Support
- Human-Automation Interaction – Intro and Function Allocation
- Human-Automation Interaction – An Example of Different Ways of Looking at Automation
- Human-Automation Interaction – 3 Takes on the Same Problem

## Course Materials

**Note: Course materials may vary with each offering. The example below is typical but subject to change.**

**Textbook**

No textbooks are used.  Readings are posted on Canvas.

## Course notes

Course notes are up to the discretion of the student to take/make.  No official notes are created or shared with students.