

IE-341

Section 1, CRN: 30512/513/514

Section 2, CRN: 30515/516/517

Section 3, CRN: 38299/300/301

First Semester 1437-38H (Fall-2016) – 3(2,1,2)

“HUMAN FACTORS ENGINEERING”

Tuesday, October 25, 2016 (24/01/1438H)

Homework 1

Name:	Student Number: 4	Section: Mon: 08 / Mon: 10
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Answer **ALL** of the following questions.

1. Compare **five** industrial products to their ergonomic versions. You are also requested to highlight the main feature(s) that distinguish the ergonomic product. An example that was mentioned in class is displayed below. [5 points]



Note, you can earn **extra credit** by suggesting (using sketches) additional ergonomic design features to each example.

2. The following is an exercise aimed at performing a sample redundancy comparison between the English and Arabic languages [5 Points]. You are requested to:
- Find an article in each language, both related to the same topic (e.g. industrial engineering). A best case scenario would be to find an original version and the translated version of that article (if possible).
  - Choose the first 10,000 letters in each article and place them in separate files.
  - Find the recurrence for each letter of the alphabet in each article, i.e. a/A – z/Z for the English article and ا\أ-ي\ي in the Arabic article. Be careful to consider each variation of a certain letter as a separate letter (e.g. ي\ي\ى can be considered 3 different letters).
  - Calculate the maximum amount of information ( $H_{max}$ ) that can be achieved by each letter set (i.e. alphabet).
  - Find the probability ( $p_i$ ) of occurrence of each letter.
  - Calculate the average amount of information ( $H_{ave}$ ) for each article.
  - Calculate the redundancy percentage using d) and f) for each article.
    - Compare these results (in your own way) to those previously discussed in class.
  - Hint, use both MS Word and MS Excel to perform these calculations.

### Rules:

- You must prepare and submit the homework **individually**.
- All work must be neatly typed and printed.
- Use **proper English**.
- Show all work and answer each question on a **separate sheet**.
- BOX** your answer(s) and include the **units** (if applicable).

Due date: **Wednesday, November 02, 2016 (2/2/1438)**, beginning of class. NO late homework will be accepted.