



## Course Syllabus

### General Information

Course Number: InIn 6016

Course Title: **Human Factors Engineering**

Credit-Hours: Three

### Course Description

Human factors application in the design of equipment and work environment. Methods for the analysis of human errors and skills and their utilization in the design of control systems and information displays.

### Prerequisites

Authorization of the Director of the Department

### Textbook and References

- Chengalur, S.N., Rodgers, S.H., Bernard, T.E. 2004, Kodak's Ergonomic Design for People at Work, 2nd Edition, John Wiley & Sons, Inc. (R1)
- Wickens, C.D., Lee, J.D., Liu, Y., Gordon, S.E., 2004, an Introduction to Human Factors Engineering, 2nd Edition, Prentice Hall. (R2)
- Kroemer, K., Kroemer, H., and Kroemer-Elbert, K., 2000, Ergonomics How to Design for Ease & Efficiency, 2nd Edition, Prentice Hall.

### Purpose

This is an elective course for the completion of an ME degree in industrial engineering. It has been primarily designed for a major in industrial engineering; however, it is appropriate for anyone with interest in the areas of ergonomics and work design. The purpose is to gain basic knowledge in human anatomy, biomechanics, physiology, and the human information processing; learn to perform ergonomic workplace assessment, and design work for the prevention of cumulative trauma disorders.

### Course Goals

After completing the course, the student should be able to perform ergonomic workplace assessment and design work and workplace for the prevention of cumulative trauma disorders.

### Requirements

All students are expected to come to class all the time, on time, and prepared; do all assigned readings and related work; actively participate in class discussions; and satisfy all assessment criteria to receive credit for the course.

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### Department and Campus Policies

**Class attendance:** Class attendance is compulsory. The University of Puerto Rico, Mayagüez Campus, reserves the right to deal at any time with individual cases of non-attendance. Professors are expected to record the absences of their students. Frequent absences affect the final grade, and may even result in total loss of credits. Arranging to make up work missed because of legitimate class absence is the responsibility of the student. (Bulletin of Information Undergraduate Studies)

**Absence from examinations:** Students are required to attend all examinations. If a student is absent from an examination for a justifiable reason acceptable to the professor, he or she will be given a special examination. Otherwise, he or she will receive a grade of zero or "F" in the examination missed. (Bulletin of Information Undergraduate Studies)

**Final examinations:** Final written examinations must be given in all courses unless, in the judgment of the Dean, the nature of the subject makes it impracticable. Final examinations scheduled by arrangements must be given during the examination period prescribed in the Academic Calendar, including Saturdays. (see Bulletin of Information Undergraduate Studies).

**Partial withdrawals:** A student may withdraw from individual courses at any time during the term, but before the deadline established in the University Academic Calendar. (see Bulletin of Information Undergraduate Studies).

**Complete withdrawals:** A student may completely withdraw from the University of Puerto Rico, Mayagüez Campus, at any time up to the last day of classes. (see Bulletin of Information Undergraduate Studies).

**Disabilities:** After being identified with the professor and the institution, the students with disabilities will receive reasonable accommodations in their courses and evaluations. For more information, please contact *Student Services with Disabilities* at the Student Dean's Office at (Q-019), 787-265-3862 ó 787-832-4040 x-3250 ó 3258.

**Ethics:** Any academic fraud is subject to the disciplinary sanctions described in article 14 and 16 of the revised General Student Bylaws of the University of Puerto Rico contained in Certification 018-1997-98 of the Board of Trustees. The professor will follow the norms established in articles 1-5 of the Bylaws.

### Campus Resources

General Library and University Computer Center is available to obtain professor=s reference materials. The University=s Counseling Office has a tutorial program for students who need extra help.

## Course Syllabus

General Topics		
Lecture	Topic	Reading
<b>1</b>	Introduction – Need for Ergonomic Job Design – Definitions – Ergonomic Standards	R1: Ch. 1
<b>2</b>	Research and Evaluation Methods – Experimental Research – Descriptive Methods	R1 & R2: Ch. 2
<b>3</b>	Visual System – Light – Color and Perception	R1: Ch. 8 R2: Ch. 4
<b>4</b>	The senses – Noise – Touch – Vestibular System – Vibration	R1: Ch. 8 R2: Ch. 5
<b>5</b>	Cognition – Information Processing – Decision Making Models	R2: Ch.6,7
<b>6</b>	Controls and Displays	R1: Ch. 3,4 R2: Ch. 8, 9
<b>7-8</b>	Anthropometry and work design	R1: Ch. 3 R2: Ch 10
<b>9-10</b>	Biomechanics – Musculoskeletal system – Low-back problems – Lifting guides – Manual Materials Handling	R1: Ch: 2, 7 R2: Ch. 11
<b>11</b>	Work Physiology – Circulatory system – Respiratory system – Work Capacity and Fatigue	R1: Ch. 6 R2: Ch12
<b>12-13</b>	Worker Selection and Training – Tests and Procedures – Analysis methods	R1: Ch. 2 R2: Ch. 18
<b>14</b>	Stress and Workload	R1: Ch. 6 R2: Ch. 13
<b>15</b>	Design for special populations	Instructor's Notes