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| <b>ID</b>                | 3086   |
| <b>Curricular Unit</b>   | Ergonomic Analysis of Complex Systems  |
| <b>Regent</b>            | Teresa Margarida Crato Patrone de Abreu Cotrim   |
| <b>Learning Outcomes</b> | <ol style="list-style-type: none"> <li>1. Understanding fundamentals and mastering concepts related to ergonomic intervention methodologies for optimizing interaction of workers with complex systems, such as healthcare and transport systems.</li> <li>2. Understanding, mastering and applying specific methods for ergonomic analysis in complex systems (healthcare and transport) for the purpose of making an ergonomic diagnosis.</li> <li>3. Recognizing validity and reliability aspects in the selection of methods for the purpose of ergonomic work analysis.</li> </ol>  |
| <b>Syllabus</b>          | <ol style="list-style-type: none"> <li>1. Introduction to complex systems: Concepts and definitions.</li> <li>2. Criteria for the selection of observational methods in ergonomics. Design and validation of instruments for observational methods in ergonomics. Application and validation of Strain Index.</li> <li>3. Methods and Techniques for Ergonomic Analysis in Complex Systems: Delphi panel; FRAM.</li> <li>4. Methods and Techniques for Ergonomic Analysis of mental workload: Mental workload evaluation methods. <ul style="list-style-type: none"> <li>- NASA-TLX (Task Load Index)</li> <li>- Driving Activity Load Index (DALI)</li> <li>- Rating Scale of Mental Effort (RSME)</li> <li>- Subjective Workload Assessment Technique (SWAT) e (C-SWAT) Continuous-SWAT</li> <li>- Bartenwerfer's Mental Activation scale</li> <li>- Modified Cooper-Harper scale (MCH)</li> </ul> </li> <li>5. Psychosocial Risk Factors in Complex Systems: <ul style="list-style-type: none"> <li>- Concepts and definitions;</li> <li>- The Portuguese version of the Copenhagen Psychosocial questionnaire;</li> </ul> </li> <li>6. Characterization of transports' contexts in view of the determinants of drivers' mental activity. Model of Michon and Model of SRK by Rasmussen<br/>Specific methods and techniques for ergonomic analysis in transports context<br/>Practical applications.</li> </ol> |

Model A: The evaluation model is based on two tests to be held during the semester based on the resolution of practical problems.

## Evaluation

Model B: The final evaluation model consists of making a final exam which integrates theoretical and theoreticalpractical contents.

In any of these models the theoretical componente represents 50% and the practical component 50%

### Main Bibliography

Stanton, N. e Young, M. (1999), A Guide to Methodology in Ergonomics, Taylor and Francis, London.

Wilson e Corlett (1990), Evaluation of Human Work, Taylor and Francis, London.

Kirvan, B. e Ainsworth, L. (1992), A Guide to Task Analysis, Taylor and Francis, London.

Hedge, K. Brookhuis, E. Salas, H. Hendrick & N. Stanton, (2005), Handbook of Human Factors and Ergonomics Methods, CRC Press.

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Hollnagel (2012). FRAM: The functional Resonance Analysis method. Ashgate.

Carayon, Pascale (ed) (2006), Handbook of Human factors and ergonomics in Health Care and patient safety, CRC Press.

de Waard, Dick (1996) "The Measurement of Drivers' Mental Workload", Thesis published by the Traffic Research Centre, University of Groningen.

Stanton, N., editor (2012), Advances in Human Aspects of Road and Rail Transportation, CRC Press.

Complementary Bibliography:

To be provided in class.