

Subject Description Form

Subject Code	CSE464
Subject Title	Ergonomics and Human Factors
Credit Value	3
Level	4
Pre-requisite / Co-requisite / Exclusion	Pre-requisite : CSE377 or SN3617
Objectives	This subject aims to equip students with the ability to design and develop a better workplace, work environment and human-machine interface by applying the knowledge and principles of human and ergonomic factors, so as to achieve safety and health of persons at work and at the same time enhance the work efficiency.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: - understand the importance of ergonomics in the improvement of productivity and well-being of the workers; - apply the principles of anthropometric and biomechanical techniques in the evaluation of ergonomics hazards; - devise work systems that allow individuals to accomplish their work without developing excessive fatigue; - apply ergonomics principles to reduce or prevent work-related injuries and diseases; - grasp basic knowledge on historical development of ergonomics and human factors.
Subject Synopsis/ Indicative Syllabus	<u>Introduction</u> A brief history of ergonomics and human factors including their definitions. Introduction to common ergonomic hazards and illnesses. Introduction to the principles of ergonomics and the areas of applications. <u>Anatomy and Physiology as Applied to Work</u> Anthropometry: anthropometric data, statistical concepts and anthropometric applications. Biomechanics: biomechanical classification of movements; physiological and operational categories of movement. Anthropometric and biomechanical techniques applied to ergonomic hazard analysis and control. <u>Work Physiology and Shift Work</u> Physiological response. Energy and energy sources of the body. Categories of work. Physical work capacity. Fatigue and its evaluation. Classification of workload. Endurance in physical work and work-rest scheduling. <u>Human Information Processing</u> Physiological mechanism in human information processing. Model of human information processing. Mental workload. Sensation and perception. Methods to improve ability of information processing. Attention. Signal detection. Behaviour-based safety. Behavioural accident prevention process. Human reliability methods.

Student Study Effort Expected	Class Contact	Average hours per week
	▪ Lectures / Tutorials / Site Visit	3 Hrs.
	Other student study effort	
	▪ Coursework	2.5 Hrs.
	▪ Self Study	3.5 Hrs.
	Total student study effort	9 Hrs.
Reading List and References	Essential Textbooks: Kroemer, K. H. E., Kroemer, H. B. and Kroemer-Elbert, K. E. (2000). <i>Ergonomics: How to Design for Ease and Efficiency</i>. (Second Edition). Englewood Cliffs, N.J: Prentice Hall. Bridger R. S. (2003). <i>Introduction to Ergonomics</i>. (Second Edition). London: Taylor & Francis. Reference Textbooks: Tayyari F. and Smith J. L. (1997). <i>Occupational Ergonomics: Principles and Applications</i>. London: Chapman & Hall. Oborne D. J. (1995). <i>Ergonomics at Work</i>. (3rd Edition). Chichester: John Wiley & Sons. Karwowski W. and Marras W. S. (Editors). (2003). <i>Occupational Ergonomics: Design and Management of Work Systems</i>. Boca Raton: CRC Press.	

