DEPARTMENT OF INDUSTRIAL ENGINEERING
COURSE SYLLABUS

COURSE TITLE	*ENGLISH CODE/NO*	*ARABIC CODE/NO.*	*CREDITS*			
			Th.	*Pr.*	*Tr.*	*Total*
Work Study	**IE 341**	هـ ص ٣٤١	3	2	-	3
Pre-requisites:	IE 331					
Course Role in Curriculum	*Required or Elective:*		Required Core Course			

Catalogue Description:
Introduction to Work Study (WS). Productivity and WS. WS approaches. Basic procedure of motion study: job selection, recording facts, critical examination, etc. String diagram, Multiple activity chart, Travel chart. Principles of motion economy. Two-handed chart. Fundamental hand motions. Micro-motion and Memo-motion studies. Cyclegraph and Chrono-cyclegraph. Work Measurement (WM). Work sampling. Time study. Computerized WM. PMTS: MTM, Work factor and Standard data. Wage payment and incentive plans.

***Textbooks*:**
Groover, M. P. (2007). **Work Systems and the Methods, Measurements and Management of Work.** Pearson (Education, Inc), US.
Reference Materials:
Kanawati, G, (Ed), 1992, **Introduction to Work Study**, 4th revised edition, International Labor Office: Geneva. (ISBN 92-2-107108-1).

***Supplemental Materials*:**
Class notes/handouts materials provided by the instructor.

***Course Learning Outcomes*:**
By the completion of the course the student should be able to:

1. Demonstrate an understanding of the fundamental concepts of work systems and work study.
2. Apply different types of engineering work methods such as charting and diagrams techniques in operations and job analysis (laboratory experiments & case study).
3. Apply various types of engineering work measurements such as direct time study, predetermined motion time systems (PMTs), Standard Data Systems, work sampling in analysing time of tasks (laboratory experiments).
4. Attain a grasp of the fundamental principles of experimental design, collection of data related to work study, and their analysis and interpretation (laboratory experiments).
5. Work in a team and communicate effectively in performing the assigned works.

	Topics to be Covered:	***Duration in Weeks***
1	**Introduction to Work Study and System:** The Nature of Work, Work Study, Important of Work Study and Principles, Defining Work Systems, Types of Occupations, Productivity, Excess Nonproductive Activities, Allocation of Total Task Time.	1.5
2	**Methods Engineering & Layout Planning:** Methods Engineering Definition & objectives, Operations Analysis, Methods Analysis, Methods Design, Techniques of Methods Engineering: Charting & Diagramming Techniques, Motion Study and Work Design. Objectives of Charts and Diagrams, Charts and Diagrams: Operation Charts, Process Charts (Flow Process Chart, Worker Process Chart & Form Process Chart), Flow Diagram, Activity Charts (Right-hand/left-hand activity chart, Worker-Machine Activity Chart, Worker-multimachine activity chart) . Basic Motion Elements, 17 Therbligs Basic Motion Elements, Micro-motion Analysis, Principles of Motion Economy.	6
3	**Time Study and Work Measurement:** Time Standards definitions and How They Are Determined, Time study definitions. Functions of Time Standards, Methods to Determine Time Standards, Allowances in Time Standards. Direct Time Study Procedures, Performance Rating, Time Study Equipment. Overview of Predetermined Motion Time Systems, Methods-Time Measurement (MTM), MTM-1, MOST. Using a Standard Data System, Work Element Classification in Standard Data Systems. Work Sampling Defined, Work Sampling Applications, Statistical Basis of Work Sampling, Number of Observations Required, Use of Work Sampling to Measure Average Task and Standard Times. Learning Curve Theory, Determining the Learning Rate, Crawford model in learning curve, Time Standards Versus the Learning Curve.	6.5

Student Outcomes addressed by the course: (Put a √ sign)

(a)	an ability to apply knowledge of mathematics, science, and engineering	
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	√
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	√
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

Key Student Outcomes assessed in the course: (b) and (j)

Instructor or course coordinator: Dr. Abdulrahman Basahel
Last updated: February 2015