

Course number and name	END341 / Work Study & Design
Credits, contact hours, categorization of credits	3 credits / 42 hours / Engineering topic
Instructor or course coordinator	Fethi CALIŞIR, Cigdem ALTIN GÜMÜŞSOY
Text book and other supplemental materials	<ul style="list-style-type: none"> • Lecture Notes • Barnes, R. (1990); “Motion and Time Study”, John Wiley and Sons Ltd. • Niebel, B.W. (1998); “Motion and Time Study”, Irwin • Freivalds, A., Niebel, B.W. (2009),” Niebel’s Methods, Standards, and Work Design”, McGraw Hill International Edition. • Groover, M.P. (2007), “Work Systems and the Methods, Measurement and Management of Wok”, Pearson Prentice Hall.

Course information	
Content	Provide an overview of the interdisciplinary field of work analysis & design and attention is devoted to equip the students with the basic skills, tools, and principles for designing efficient tasks and workspaces.
Prerequisites	END 232 Ergonomics
Type	Required

Course learning outcomes
<p>Students who pass the course will:</p> <ol style="list-style-type: none"> I. Recognize the various dimensions of Work Analysis & Design and appreciate the importance and integration of each independent factor to the overall safety and effectiveness of an individual. II. Explain the concept of productivity and its importance to an organization. III. Draw assembly charts, operation process charts, flow process charts, flow diagram, cross-functional process maps, activity charts. IV. Set time standard using a stop watch method. V. Set time standard to a simple job by using work sampling method. VI. Set time standard to a simple job by using predetermined time systems method. VII. Assess the physical work environment including ambient temperature, visual, hearing & noise, and vibration. VIII. Work in teams to complete class assignments.

Student outcomes	Level of contribution
SO1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Not applicable
SO2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	Partial
SO3. An ability to communicate effectively with a range of audiences.	Little
SO4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	Little
SO5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Little
SO6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Partial
SO7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	Little

Week	Topics	Learning outcome(s)
1	Introduction to Work Study	II, IV, VI
2	Process & Operation Analysis Tools (P&OAT) – Assembly Chart, Operation Process Chart	II, IV
3	P&OAT - Flow Process Chart, Flow Diagram, Cross Functional Process Maps	II, IV
4	P&OAT - Flow Process Chart, Flow Diagram, Cross Functional Process Maps	II, IV
5	Work Measurement	II, IV, VI
6	Time study	II, IV, VI
7	Time study	II, IV, VI
8	Work Sampling	II, VI
9	Work Sampling	II, VI
10	Motion Study	II, IV
11	Predetermined Time Systems	II, IV
12	Work Environment Design	II
13	Work Environment Design	II
14	Project Presentations	III, V, VII, VIII