Instructor Information
Instructor: Dr. Julie Dunston
Class Meeting Times: M/W, 1:00 – 2:15 p.m.
Course Location: ENGR A220
Office Hours: T/R, 11:00 a.m. – 2:00 p.m.
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Course Webpage: https://online.siu.edu

Course Objective
The objective of this course is to provide students with the tools necessary to design a work area (e.g. facility, department, workstation) from various aspects including time standards development and uses, throughput requirements, ergonomics, lean manufacturing, methods engineering, work environment, safety, material handling, process flow, and cost. Various methods and techniques will be introduced and utilized to analyze the effectiveness and efficiency of a given layout.

Course Format
This course will primarily be conducted in the form of lectures and in-class exercises. Several case studies will be examined throughout the course to demonstrate real-world applications of the various techniques presented. The case studies will be assigned to teams throughout the course, in place of a major end-of-semester project.

Course Materials

Graded Items (modify as appropriate)
- Assignments – 20%
- Case Studies – 15%
- Exam 1 – 20%
- Exam 2 – 20%
- Exam 3 – 20%
- Attendance/Participation – 5%
Grading Scale
A: 90 - 100%
B: 80 - 89%
C: 70 - 79%
D: 60 – 69%
F: < 60%

Lessons (Topics)
Lesson 1: Facilities Planning Introduction
Lesson 2: Product Design
Lesson 3: Process Design
Lesson 4: Schedule Design
Lesson 5: Facilities Design (Seven Management and Planning Tools)
Lesson 6: Flow Systems
Lesson 7: Department Planning
Lesson 8: Space Requirements
Lesson 9: Material Handling
Lesson 10: Warehousing, Receiving, and Shipping
Lesson 11: Ergonomics and Workplace Design
Lesson 12: Work Environment/Cognitive Design
Lesson 13: Time Study
Lesson 14: Performance Rating and Allowances
Lesson 15: Standard Data and Formulas
Lesson 16: Work Sampling

Student Learning Objectives
At the end of the course, the student should be able to do the following:
• Define the factors to consider in selecting a facility location.
• Explain the importance of material flow and flow analysis.
• Construct flow analysis tools: string diagram, multicolumn process chart, from-to chart, process chart.
• Calculate flow efficiency using a from-to chart.
• Explain the use of an activity relationship chart.
• Construct an activity relationship chart.
• Construct a dimensionless block diagram.
• Balance an assembly line.
• Construct a route sheet.
• Calculate machine fraction requirements.
• Analyze flow utilizing the block diagram.
• Evaluate a work area layout based on flow efficiency and space utilization.
• Calculate space requirements.
• Explain how the goals and principles of material handling relate to lean thinking.
• Describe the benefit of an efficient material handling system and explain what effect process layout has on the material handling system.
• Evaluate impact of storage/warehousing design on layout efficiency.
• Apply ergonomic principles to work space design and space determination.
• Evaluate a tool from an ergonomic standpoint and calculate CTD risk.
• Explain the guidelines for designing the work environment for optimal conditions.
• Evaluate a workstation design based on cognitive factors.
• Conduct a time study to establish time standards.
• Apply allowances to compensate for fatigue and delays at work.
• Apply standard data to common work elements.
• Calculate standard time for common machining operations.
• Calculate machine and operator utilization using work sampling results.
• Calculate appropriate allowances using work sampling results.
• Calculate time standards using work sampling results.

Late Work Policy
Assignments, case studies, etc. submitted late will be penalized 10% for each class day period after the due date. No make-up exams unless prior approval is given by instructor.

SIU Policy on Incomplete Grades
An INC is assigned when, for reasons beyond their control, students engaged in passing work are unable to complete all class assignments. An INC must be changed to a completed grade within a time period designated by the instructor but not to exceed one year from the close of the term in which the course was taken, or graduation, whichever occurs first. Should the student fail to complete the course within the time period designated, not to exceed one year, or graduation, whichever occurs first, the incomplete will be converted to a grade of F and the grade will be computed in the student’s grade point average. Students should not reregister for courses in which an INC has been assigned with the intent of changing the INC grade. Re-registration will not prevent the INC from being changed to an F.

Attendance Policy
A maximum of 3 excused absences are allowed over the course of the semester. Any unexcused absences or missing class more than 3 times will allow in a percentage of the attendance points to be lost.
Mobile Technology Policy
Students may use laptops, iPads, or netbooks to take notes during class. Cell phones are not allowed during class at any time and must be kept inside backpacks. If calculations are to be performed, you may not use the calculator on your phone; instead, you will need to bring a hand-held calculator to class.

Inclusive Excellence
SIU contains people from all walks of life, from many different cultures and sub-cultures, and representing all strata of society, nationalities, ethnicities, lifestyles, and affiliations. Learning from and working with people who differ from you is an important part of your education in this class, as well as an essential preparation for any career.

Student Code of Conduct/Plagiarism
Refer to the following sites for information on the SIU’s student code of conduct and Morris Library’s guide on plagiarism:


Emergency Procedures
Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering with the facility.
Resources for Academic Assistance

Learning Support Services: [http://tutoring.siu.edu/](http://tutoring.siu.edu/)
- Provides academic assistance in courses/tutoring

Disability Support Services: [http://disabilityservices.siu.edu/](http://disabilityservices.siu.edu/)
- Provides the required academic and programmatic support services to students with permanent and temporary disabilities

SIUC Writing Center: [http://write.siu.edu/](http://write.siu.edu/)
- Offers free tutoring services to all SIUC undergraduate and graduate students and faculty.

SIU Email Policy

Official SIU Student Email Policy: [http://policies.siu.edu/policies.email.htm](http://policies.siu.edu/policies.email.htm)
SIU Student Conduct Code:

Saluki Cares

The purpose of Saluki Cares is to develop, facilitate and coordinate a university-wide program of care and support for students in distress. By working closely with faculty, staff, students and their families, SIU Carbondale continues to display a culture of care by demonstrating to our students and their families that they are an important part of the community. To make a referral to Saluki Cares click, call, or send:
[http://salukicares.siu.edu/index.html](http://salukicares.siu.edu/index.html), (618) 453-5714, or [siucares@siu.edu](mailto:siucares@siu.edu).