ISE 319
Facilities Planning and Materials Handling
Fall Semester 2020

Instructor: L. Butler - 210 Mohler Lab (610-758-6219, lrb4@Lehigh.edu)
Office hours: T-R 12:30-2:00 and by appointment
TA: to be announced

Course Description: Facilities planning including plant layout design and facility location. Material handling analysis including transport systems and storage systems will also be covered. Utility planning and sizing with exposure to the applicable codes. Prerequisite: ISE 131 or instructor consent.

Course objectives: Upon completion of this course, students will:
- be able to describe the terminology of facilities planning, plant layout, and facilities location.
- be able to develop a plant layout design using one of the computer-aided plant layout design software packages (BlocPlan)
- be able to describe the terminology and technology of the various material handling and storage methods and systems
- be able to use appropriate mathematical models to predict the performance of various material handling systems (e.g., automated guided vehicle systems, conveyor systems) and storage systems (automated storage and retrieval systems, carousel storage systems)
- be able to properly size an electrical service, gas service and plumbing service based on the appropriate building codes
- be aware of the issues involved in the accessibility requirements of the building codes.
- be able to refer to sections of the building codes that deal with sustainability and suggest changes to the codes that would improve sustainability.

Text: The textbook is: Thomas, *Building Code Essentials, 2015 edition*, ICC Publications, 2015.

Grading Policy: The grade in the course will be based on the student's performance in two hour quizzes, a team project, the final exam, and other assigned work (short project problems and laboratory exercises). A point scoring system will be used in which each quiz will be worth 200 points, the final exam will be worth 300 points, and project exercises will total 200 points. In addition, bonus point opportunities will be offered during the semester. Students will be graded according to the total points they accumulate in the scoring system.

Hour Quiz Policy: Two one-hour quizzes will be offered during the semester. No make-up quizzes will be given to students who miss the regular quizzes. For students who take both quizzes and the team project, the lowest quiz grade will be dropped and the average of the quiz and the project will be substituted in its place. For students who miss one hour quiz, the average of the quiz and the project will be counted for the missing grade. For students missing more than one quiz, 50% of the percentage score on the final exam will be used as the missing hour quiz grades.

Hour Quiz Formula Sheet: Each student will be allowed to use a formula sheet that he/she has prepared in advance of each hour quiz. A one-page formula sheet is recommended, but the formula sheet can consist of multiple pages if needed. The same formula sheets prepared for the hour quizzes can be used for the final exam. The formula sheet should contain only equations and formulas. However, up to three words can be used to identify each equation and symbol, and the proper units can be listed for each symbol. There are to be NO EXAMPLE PROBLEMS, no sketches, no diagrams, no lists, or other text material on the formula sheets. Formula sheets will be turned in with the quiz. If a formula sheet is found to be in violation of the guidelines, no credit will be given for the quiz or exam problem to which the violation refers.

Homework Policy: Practice problems will be assigned about one week in advance of their due date. These problems will be demonstrated and discussed in class and will not normally be turned in. Individual students will be assigned to present problem solutions in class. Up to 5 bonus points will be awarded for each practice problem presented in class, to be added to the student's total point score for grading purposes. On a

periodic sampled basis, practice problems may be collected in class and unannounced short quizzes may be given for additional bonus points.

Laboratory Exercises. A number of laboratory exercises will be assigned during the semester. Most exercises will be completed outside of normal class hours. For take-home exercises, a due date will be specified, and the solutions must be turned in by the due date for full credit. Submissions cannot be accepted for credit after the graded problems are turned back to the class. A grade of zero will be recorded for the student in these cases.

Project: A project will be assigned near the end of the semester. You will work in teams of two for the project. Both team members will receive the same grade. The project will be a plan for a building using the methods and procedures you learned in the class. It will count the same as an hour quiz. Since it is due the last day of class, there will be no time extensions

Final Exam Exemption Policy: If a student takes both hour quizzes, completes the project and achieves an average of 85% or above (without dropping the lowest grade), exhibits an exemplary attendance record, and accomplishes all required lab work and case problems satisfactorily, he/she may exempt the final exam at his/her option. The percentage score on the hour quizzes, project and other assignments will be averaged to establish the missing final exam grade.

Attendance Policy: Students are encouraged to attend class and will be held responsible for all material covered in class, including any announcements about homework or quizzes and all material on Coursesite. Students who elect not to attend class are expected to maintain a "passing" level of performance. If they do not, the instructor may use the Section III procedures to issue warnings of possible failure. If a student is missing class and does not take the first hour quiz, a Section III warning may be given. If a student misses the first two hour quizzes, a Section III will be issued regardless of his/her attendance record.

Neatness and Legibility in Submitted Work: On any work submitted for course credit (e.g., lab reports, case problems, hour quizzes, final exam), the student is responsible for expressing his/her solutions and written material in a neat, orderly, concise, and legible fashion. Problem solutions should exhibit a logical, step-by-step progression toward the final answer. Reports and case problems should be in the most appropriate format and be written in ink or typewritten. The student is responsible for proofreading all submitted reports. Failure to accomplish any of the above may constitute grounds for reduction of credit on submitted work.

Accommodations for Students with Disabilities:
Lehigh University is committed to maintaining an equitable and inclusive community and welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact Disability Support Services (DSS), provide documentation, and participate in an interactive review process. If the documentation supports a request for reasonable accommodations, DSS will provide students with a Letter of Accommodations. Students who are approved for accommodations at Lehigh should share this letter and discuss their accommodations and learning needs with instructors as early in the semester as possible. For more information or to request services, please contact Disability Support Services in person in Williams Hall, Suite 301, via phone at 610-758-4152, via email at indss@lehigh.edu, or online at https://studentaffairs.lehigh.edu/disabilities.

The Principles of Our Equitable Community:
Lehigh University endorses The Principles of Our Equitable Community (http://www4.lehigh.edu/diversity/principles). We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.