



**ÇANKAYA UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**Department of Industrial Engineering**  
**IE 302**  
**Facilities Design and Location**  
**Spring 2018**



## **COURSE SYLLABUS**

Course Code : IE 302                                      Credit Hours : (3 2 4) 6                                      Students : IE                                      Semester : Spring '18  
Course Title : Facilities Design and Location                                      Pre-requisites : IE 202                                      Year : 3                                      Section : 01, 02

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**Catalog Data:** Introduction to facilities planning; Definition of the facility location problem; Basic discrete and continuous location models and known solution techniques; Advanced location models and location-allocation models; Introduction to facilities design; Market analysis, forecasting and capacity determination; Defining requirements based on product, process and schedule design; Flow, space and relationship planning: departmentalization; Personnel requirements; Introduction to materials handling system design and warehousing operations; Introduction to plant layout; Layout optimization techniques; Comparison of computerized layout techniques; Facilities systems; Facilities design project: preparing, presenting, implementing and maintaining.

**Course Outline:** The following topics will be covered:

- Introduction to Facilities Planning
- Definition of the facility location problem
- Basic discrete and continuous location models and known solution techniques
- Advanced location models and location-allocation models
- Advanced location models and location-allocation models
- Introduction to facilities design, market analysis, forecasting and capacity determination
- Defining requirements based on product, process and schedule design
- Defining requirements based on product, process and schedule design
- Flow and space planning, departmentalization
- Personnel requirements
- Introduction to materials handling system design and warehousing operations
- Introduction to plant layout and layout optimization techniques
- Layout optimization techniques and comparison of computerized layout techniques
- Facilities systems, facilities design project (preparing, presenting, implementing and maintaining)

**Textbook:** The course is based around the following textbook:

- James A. Tompkins, John A. White, Yavuz A. Bozer, J. M. A. Tanchoco, "Facilities Planning", 4<sup>th</sup> ed., Wiley, (2010). ISBN 978-0470444047

**References:** The following useful reference books are available in the University Library:

- A. Garcia-Diaz and J.M. Smith, "Facilities Planning and Design", Pearson International Edition, Prentice Hall, (2007). ISBN 978-0131481916
- D.R. Sule, "Manufacturing Facilities: Location, Planning and Design", 3<sup>rd</sup> ed., CRC Press, (2008). ISBN 978-1420044225
- Sunderesh Heragu, "Facilities Design", 3<sup>rd</sup> ed., PWS Publishing Company, (2008). ISBN 978-1420066265
- R.G. Askin and C. R. Standridge, "Modeling and Analysis of Manufacturing Systems", John Wiley & Sons, Inc., (1993). ISBN 978-0471514183
- R.L. Francis, F. McGinnis, J.A. White, "Facility Layout and Location: An analytical approach", 2<sup>nd</sup> ed., Prentice Hall, (1998). ISBN 978-0132991490
- Mikell P. Groover, "Automation, Production Systems, and Computer-Integrated Manufacturing", 4<sup>th</sup> ed., Prentice Hall, (2014). ISBN 978-0133499612

**Teaching Method:** Teaching will be based on enabling the students to understand the concepts and procedures in each topic section and to be able to apply them. To do this the course will be organized into two modules: Lectures and Tutorials/Laboratory sessions.

**Lectures:** In lectures the instructor will attempt to summarize and explain only selected important concepts and points as clearly as possible. To be familiar with the material presented in lectures and participate in class discussions, students are expected to read the material covered in the previous lectures prior to the class meeting. Students will then find the lectures more interesting, and will benefit from the discussion if they come well prepared.

**Tutorials:** In addition to the regular lectures, there will be tutorial sessions conducted in the classroom/laboratory by the assistant, according to the perceived need. In these hours the assistant will do extra example problems and give tutorials on computer applications and show videos related with the lecture materials.

**Project Study:** Students should form groups of at most **4 students** in order to perform project work.

**Exams:** All examinations will be based on lectures, tutorials, labs, and project work. To pass these exams students will need to have studied the material well in advance in order to understand the concepts, procedures and techniques. To discourage last minute cramming, the instructor and the assistants will not answer any questions from students on the day of an examination. Descriptions of these examinations are as follows:

Midterm Exam: There will be one midterm examination that covers all the material up to the date of the examination.

Final Exam: The Final Examination will cover all the material studied throughout the semester and has the same structure as in the midterm examination.

**Note: The students need a calculator so they should bring their own calculators to all lecture/tutorial/lab/exam hours.**

**Make-up Exam:** Make-up examination will only be offered (at the end of the semester) to students who missed the **final examination or midterm exam** and provided adequate documentations for the reason of their absence.

**Attendance:** With a minimum of 45% attendance is necessary and it will be taken every lecture and tutorial/lab session. Without considering whether the students that satisfy or does not satisfy this minimum attendance requirement all students may enter the final exam.

**Academic Dishonesty:** Any act not suitable for a university student will not be tolerated and may lead to formal disciplinary action. Example of this are: getting someone else to take the examinations for you, misrepresentation of your own answer sheet as another's work, cheating, knowingly assisting other students to cheat, abusing the tolerance or breaking the discipline of the class.

**Grading Policy:** Although the student's overall grade will be based on the general assessment of the instructor, the following percentages may give an idea about the relative importance of various assessment tools.

Home Work	15 %
Lab Work	10 %
Project Study	15 %
Midterm Exam	25 %
<u>Final Exam</u>	<u>35 %</u>
TOTAL	100 points

Note that the instructor reserves the right to modify these percentages in case he finds it necessary. Letter grade equivalents of numerical performances will be announced by the Registrar's Office after the last day for the submission of letter grades.

**NA Grading: Conditions that might lead to "NA" grade:**

1. Not attending **both Final Exam and Midterm Exam or their Make-up Exams without a valid excuse.**
2. **having an overall grading either "FF" or "FD" and the overall attendance to lectures/tutorials/labs/etc. less than 45%.**