אורט בראודה
ORT Braude College

Cases in Industrial Engineering

Course #: 51113
Credit Points: 2.5
Semester\Year: Spring, 2020
Timing: Tuesday, 15:30-18:30 Room # **204EM**

Dr. Hussein Naseraldin

Email: nhussein@braude.ac.il
LinkedIn: linkedin.com/in/husseinnaseraldin
Office hours: Tuesday 14:30-15:30. Via Zoom or Skype: 48/5. Via Email: 24/7
Room: 215, M Building

Course Objectives

The ultimate objective of this course is to allow the industrial engineering (IE) student to experience all stages of problem solving, ranging from problem identification and formulation to problem validation and verification using IE methodologies, tools, and techniques. The approach is based on a framework that integrates creativity and problem solving, which enhances the effectiveness of the problem-solving process. To obtain the objectives, cases from the industry are introduced to allow the student to tackle problem of real-world flavor.

Learning Outcomes

By the end of the semester, the students will know

1. To tackle an engineering industrial problem, to identify the root cause, to define the objective and constraints.
2. To verbally formulate the problem using various group techniques
3. To use a critical thinking approach towards the assumptions
4. To use quantitative and qualitative models
5. To enhance critical thinking towards problem solving
6. To develop independent learning skills

General Description

1. The approach in the course is quantitative in nature. The student will identify, formulate, analyze, model, solve, verify, and validate the problem.
2. The learning will be based on cases from industry, each will span two meetings.
3. At the outset of each case, a short description of the case will be handed. Group work will be done to identify the problem. For each case, a practicum will be handed by the group at the end of the second meeting. It is advised to start working on the practicum after the first meeting. Guiding questions will be handed.
4. Active learning elements will be integrated in the meetings. Groups thinking, quizzes, interactive tools, among others, will be utilized.
5. Each activity in the course will be graded.
6. Submission will be only via the Moodle course site.

Prerequisite Courses

Planning of the Supply Chain, 51132

Production Systems Management, 51131

Financial Management, 51608

Expectations

1. To participate actively in the meetings
2. To contribute personally and originally to each practicum
3. To use the models, approaches, and frameworks introduced in the course

Final Grade

55% Practicum

- 6 practicums will be handed. Each one will provide an opportunity to use advanced tools and apply the approaches learnt in class.
- Groups are encouraged to develop solutions other than the solution presented in class (in such case, up to 50% bonus will be given to well-developed ideas). Practicum will be tackled in groups of three. One member of the group should upload the solution on behalf of the group.

- After each practicum, individual reflection report is requested (will be part of the grading).
- Inquiries about the grade should be within one week of returning the feedback

25% Independent Case

- Each group will be handed a new case that won't be covered in class. The group will be required to hand in a report based on guidelines yet to be handed
- The group will present their solution to the class

20% Active Participation

- This course is heavily based on active participation in class. Group discussion in class, asking inquiry questions, answering questions by others etc.
- To be eligible to be graded, at least 80% attendance is required.

References

[1] Silver E. A., Pyke D. F., Peterson R., Inventory Management and Production Planning and Scheduling, 3ed, John-Wiley & Sons, 1989.

[2] שלמה גלוברזון, ניהול הפתעול והייצור, גומא ספרי מדע ומחקר, 1990.

[3] Morris T. M., On the Art of Modeling, Management Science, Vol. 13, No. 12, 1967.

[4] Evans J. R., Creativity in MS/OR: Improving Problem Solving through Creative Thinking, Interfaces, 22(2), 1992.

[5] Resman A., Creativity in MS/OR: Creative Thinking, A Basis for MS/OR Problem Solving, Interfaces, 21(5), 1991.

[6] McFadzean E., Creativity in MS/OR: Choosing the Appropriate Technique, Interfaces 29(5), 1999.

Course Plan

Meeting 1 **Topic:** Introduction to problem solving, creativity in engineering **Outcome:** a framework for creative problem solving	**Meeting 2+3** **Case:** Plastic Baskets **Topic:** Forecasting &Production Planning **Outcome:** Forecasting, production planning and inventory storage
Meeting 4 **Topic:** Independent Case Analysis **Outcome:** Problem identification and formulation	**Meeting 5** Online Meeting **Topic:** Advanced Excel Tools **Outcome:** Introduction to Palisade (Add-in to Excel)

Meeting 6+7 **Case:** Bananas **Topic:** Interdisciplinary aspects, production planning **Outcome:** Advanced tools for planning	**Meeting 8** **Topic:** Independent Case Analysis - Continued **Outcome:** Model Development and Validation
Meeting 9+10 **Case:** Printed Circuit Board (PCB) production planning **Topic:** Production strategy, planning **Outcome:** Identify strategies, production planning	**Meeting 11** **Visitor from Industry**
Meeting 12 **Independent case presentation**	**Meeting 13** **Topic:** A framework of the framework **Outcome:** Tools and approaches to tackle non-engineering problems