

# TOROS ÜNİVERSİTESİ

Faculty Of Engineering  
Industrial Engineering (English)

## Course Information

| RISK AND RELIABILITY ANALYSIS |          |             |          |                 |             |
|-------------------------------|----------|-------------|----------|-----------------|-------------|
| Code                          | Semester | Theoretical | Practice | National Credit | ECTS Credit |
|                               |          | Hour / Week |          |                 |             |
| INE341                        | Fall     | 3           | 0        | 3               | 3           |

|                                             |                                                                                                                                                                                                |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Prerequisites and co-requisites</b>      | none                                                                                                                                                                                           |
| <b>Language of instruction</b>              | English                                                                                                                                                                                        |
| <b>Type</b>                                 | Elective                                                                                                                                                                                       |
| <b>Level of Course</b>                      | Bachelor's                                                                                                                                                                                     |
| <b>Lecturer</b>                             |                                                                                                                                                                                                |
| <b>Mode of Delivery</b>                     | Face to Face                                                                                                                                                                                   |
| <b>Suggested Subject</b>                    | none                                                                                                                                                                                           |
| <b>Professional practise ( internship )</b> | None                                                                                                                                                                                           |
| <b>Objectives of the Course</b>             | The objectives of this course is to provide ability of defining and managing possible risks in business world and to present risk assessment techniques to student.                            |
| <b>Contents of the Course</b>               | Definition of risk, risk perception, risk management, risk assessment, qualitative and quantitative risk assessment techniques (FMEA,FTA, ETA, HAZOP, PHA,L and X type risk matrices, Bow tie) |

## Learning Outcomes of Course

| # | Learning Outcomes                                                                |
|---|----------------------------------------------------------------------------------|
| 1 | Student will be able to teach the risk management and assessment concepts        |
| 2 | Student will be able to gain the ability of apply risk assessment process        |
| 3 | Student will understand and apply risk evaluation methods in industrial problems |
| 4 |                                                                                  |

## Course Syllabus

| #  | Subjects                              | Teaching Methods and Technics |
|----|---------------------------------------|-------------------------------|
| 1  | Introduction to Risk                  | Lecturing                     |
| 2  | Risk, Uncertainty, Probability        | Lecturing                     |
| 3  | Risk Perception                       | Lecturing                     |
| 4  | Risk Management                       | Lecturing                     |
| 5  | Risk Management and Risk Engineering  | Lecturing                     |
| 6  | Quantitative and Qualitative Methods  | Lecturing                     |
| 7  | Preliminary Hazards Analysis          | Lecturing                     |
| 8  | Midterm                               | Exam                          |
| 9  | L and X Type Risk Analysis Techniques | Lecturing                     |
| 10 | Failure Mode and Effects Analysis     | Lecturing                     |
| 11 | Event Tree Analysis                   | Lecturing                     |
| 12 | Fault Tree Analysis Technique         | Lecturing                     |

|    |                                         |           |
|----|-----------------------------------------|-----------|
| 13 | Risk Assessment Examples                | Lecturing |
| 14 | Bow Tie Risk Assessment Technique       | Lecturing |
| 15 | Hazard and Operability Analysis (HAZOP) | Lecturing |
| 16 | Final Exam                              |           |

## Course Syllabus

| # | Material / Resources                                                                                        | Information About Resources | Reference / Recommended Resources |
|---|-------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------|
| 1 | Thomas S. Coleman, A Practical Guide to Risk Management,CFA 2011                                            |                             |                                   |
| 2 | Lee T. Ostrom, Cheryl A. Wilhelmsen, Risk Assessment: Tools, Techniques, and Their Applications, Wiley,2012 |                             |                                   |
| 3 | Michel Crouhy, Dan Galai, Robert Mark, The Essentials of Risk Management, McGraw-Hill, 2013                 |                             |                                   |

## Method of Assessment

| # | Weight | Work Type     | Work Title    |
|---|--------|---------------|---------------|
| 1 | 40%    | Mid-Term Exam | Mid-Term Exam |
| 2 | 60%    | Final Exam    | Final Exam    |

## Relationship between Learning Outcomes of Course and Program Outcomes

| # | Learning Outcomes                                                                | Program Outcomes | Method of Assessment |
|---|----------------------------------------------------------------------------------|------------------|----------------------|
| 1 | Student will be able to teach the risk management and assessment concepts        | 8                | 1,2                  |
| 2 | Student will be able to gain the ability of apply risk assessment process        | 8                | 1,2                  |
| 3 | Student will understand and apply risk evaluation methods in industrial problems | 8                | 1,2                  |
| 4 |                                                                                  |                  |                      |

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

## Work Load Details

| #  | Type of Work                                                  | Quantity | Time (Hour) | Work Load |
|----|---------------------------------------------------------------|----------|-------------|-----------|
| 1  | Course Duration                                               | 14       | 3           | 42        |
| 2  | Course Duration Except Class (Preliminary Study, Enhancement) | 14       | 3           | 42        |
| 3  | Presentation and Seminar Preparation                          | 0        | 0           | 0         |
| 4  | Web Research, Library and Archival Work                       | 0        | 0           | 0         |
| 5  | Document/Information Listing                                  | 0        | 0           | 0         |
| 6  | Workshop                                                      | 0        | 0           | 0         |
| 7  | Preparation for Midterm Exam                                  | 1        | 3           | 3         |
| 8  | Midterm Exam                                                  | 0        | 0           | 0         |
| 9  | Quiz                                                          | 0        | 0           | 0         |
| 10 | Homework                                                      | 0        | 0           | 0         |
| 11 | Midterm Project                                               | 0        | 0           | 0         |
| 12 | Midterm Exercise                                              | 0        | 0           | 0         |
| 13 | Final Project                                                 | 0        | 0           | 0         |
| 14 | Final Exercise                                                | 0        | 0           | 0         |
| 15 | Preparation for Final Exam                                    | 1        | 3           | 3         |
| 16 | Final Exam                                                    | 0        | 0           | 0         |

