

# Reliability Analysis

## Course Syllabus

- **Course information:**

- Term: 2nd Semester 2022
- Time: M5M6R5
- Room: TBA

- **Textbook:**

- Meeker, W. Q., Escobar, L. A., & Pascual, F. G. (2021). *Statistical methods for reliability data*, 2nd edition, John Wiley & Sons.

- **Contact information and office hour:**

- Office: General Building III, room 819.
- Email: [chengyus@stat.nthu.edu.tw](mailto:chengyus@stat.nthu.edu.tw)
- Office hour: by appointment. Please inform the instructor at least one day in advance.

- **Grading:**

- Your grade will be determined by assignment (30%), a midterm exam (30%), a final exam(35%), and class participation (5%).

- **Outline:**

1. Reliability concepts and reliability data
2. Models, censoring, and likelihood for failure-time data
3. Nonparametric estimation for failure-time data
4. Some parametric distributions used in reliability applications
5. System reliability concepts and methods
6. Probability plotting
7. Parametric likelihood fitting concepts: exponential distribution
8. Maximum likelihood estimation for log-location-scale distributions
9. Parametric bootstrap and other simulation-based confidence interval methods
10. An introduction to Bayesian statistical methods for reliability
11. Special parametric models
12. Failure-time regression analysis
13. Analysis of accelerated life-test data
14. More topics on accelerated life testing

- **Course pre-requisites:**

- Calculus, and Mathematical Statistics (graduate level)