

Syllabus

Spring Semester 2018

1. Class Information

| | | | |
|---------------|--|-----------------------|----------------------|
| Course | Creative Applications of Statistics to Engineering | | |
| Course # | GSQR025 | Course Classification | Core Cultural Course |
| Department | National Statistics | Credit (hrs) | 3 (3) |
| Instructor | Professor Sungsoe Rheem | TA | |
| Contact Info. | | Contact Info. | |
| Class Time | Periods 6-7, Tue. Period 8, Wed. | Class Location | 9-234 |

2. Core Competencies

| Frontier Spirit | | Sharing and Collaboration | | Pragmatic Practice | | Creative Convergence | | Global Leadership | |
|--------------------|-----------------|---------------------------|-------------------|--------------------|-----------------|----------------------|------------|-------------------|----------------------|
| Challenging Spirit | Future Insights | Empathy | social Engagement | Professionalism | Problem Solving | Innovation | Creativity | Global Mind | Global Communication |
| | | | | ● | ● | | ● | | ◐ |

Very highly associated: ● Highly associated: ◐

3. Teaching Methods

| | | | | | |
|------------------|---|---|--|-------------------------------------|--|
| Class Activity | <input checked="" type="checkbox"/> Lecture | <input type="checkbox"/> Presentation | <input checked="" type="checkbox"/> Discussion | <input type="checkbox"/> Experiment | <input type="checkbox"/> Practice |
| | <input type="checkbox"/> Collaboration | <input type="checkbox"/> Private Teaching | <input type="checkbox"/> Collective Teaching | <input type="checkbox"/> Quiz | <input type="checkbox"/> Q & A |
| Attendance Check | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Unsupervised Exam | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |

4. Evaluation

| | | | | |
|---------------------|--|---------------------|---------------|--------|
| Quiz: | Midterm: ● | Final: ● | Attendance: ● | Total: |
| Evaluation Feedback | <input checked="" type="checkbox"/> Yes (Upon Request) <input type="checkbox"/> No | Evaluation Feedback | Abs ●, Rel. | |

5. Study Plan

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|---|---|
| Class Description | This course deals with creative applications of statistics to engineering in experimental settings. Statistical design and analysis of experiments is the main topic for this course. Basic methods of experimental design and analysis will be taught in addition to fundamental ideas on statistical modeling. |
| Association with core competences and departmental objectives | This course will provide students with pragmatic practice including professionalism and problem solving. Students will also see some creativity that was used in the construction of the framework and the making of the details for this course. In addition, through the effective use of English to pass on scientific knowledge, students will be able to enhance the ability for global communication. |
| Study Objectives | Students understand how statistics is used creatively for model estimation and response optimization in engineering. |
| Class Objectives | Students actively participate in class by speaking the statements in lecture notes after the professor. This will lead students to have positive attitude. |
| Prerequisite Subjects | None |
| Textbook & References | <p><u>Textbook: Lecture notes written by Professor Sungsoe Rheem</u></p> <p>References: Box, G. E.; Hunter, J. S., Hunter, W. G., <i>Statistics for Experimenters: Design, Innovation, and Discovery</i>, 2nd Edition, Wiley, 2005</p> |
| Homework | |

6. Weekly Course Schedule

| No | Date | Week | Topic | Text | Remark |
|----|-----------|------|---|------|--------|
| 1 | 3/2-3/8 | 1 | Orientation | | |
| 2 | 3/9-3/15 | 2 | Introduction to a statistical paradigm | | |
| 3 | 3/16-3/22 | 3 | A simple model for one group | | |
| 4 | 3/23-3/29 | 4 | Estimation of the parameters in a simple model for one group | | |
| 5 | 3/30-4/5 | 5 | A single-factor second-order model | | |
| 6 | 4/6-4/12 | 6 | Estimation of the parameters in a single-factor second-order model | | |
| 7 | 4/13-4/19 | 7 | Response Optimization | | |
| 8 | 4/20-4/26 | 8 | Midterm Exam | | |
| 9 | 4/27-5/3 | 9 | A two-factor first-order model with interaction | | |
| 10 | 5/4-5/10 | 10 | Estimation of parameters in a two-factor first-order model with interaction | | |
| 11 | 5/11-5/17 | 11 | Effects and coefficients in the model | | |
| 12 | 5/18-5/24 | 12 | Interaction between two factors | | |
| 13 | 5/25-5/31 | 13 | Interpretation of interaction by the use of plots | | |
| 14 | 6/1-6/7 | 14 | Synergy and interaction | | |
| 15 | 6/8-6/14 | 15 | Review with an emphasis on the framework that penetrates the lectures | | |
| 16 | 6/15-6/21 | 16 | Final Exam | | |

7. Support for Disabled Students

8. Student Learning Ethics and Obligations

Students participating in the educational activities of our school have the following general obligations in all processes of taking courses (lecture attendance, creation and submission of assignments, examination, etc.):

- Learners actively participate in all learning with honesty and passionate attitudes based on the purpose of the university and the educational philosophy of our school.
- Learners are aware of their position as students receiving higher education and devote themselves to creative learning based on moral sensitivity.
- Learners must faithfully implement matters promised by faculty members and fellow students in connection with educational activities.
- Learners respect the character of teachers and other students and observe basic manners.

In the course of learning, plagiarism and the duplicate use of other class tasks, when it is found that it is acquired by dishonest behavior such as examination misconduct or other unreasonable method of obtaining unit, even if it is a unit already certified, will result in the cancellation of that unit. Also, you can undertake disciplinary actions such as suspension, withdrawal, and expulsion, taking into account the circumstances of the act.

The school operates the plagiarism inspection system (Blackboard) to promote the awareness of learning ethics and to promote creativity, and students must confirm whether they fall under plagiarism in advance when submitting tasks.