**MTH 210, Applied Statistics**

**2024 Fall term (Sept-Dec/2024)**

**CLASS** Thursday (14:00-16:45) , 406D7

**WORTH** 3 credits

# PREREQUISITE A grade of C or better in MTH 112.

**Google Classroom Code “ne7y5eb**”

**https://classroom.google.com/c/NzE4MDI5NzM4OTAx?cjc=ne7y5eb**

# INSTRUCTOR Dr. Pho Duc Tai

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**COURSE DESCRIPTION**

The aim of this course is to understand randomness, uncertainty, ands applications of statistical techniques, such as experimental design, hypothesis testing, parametric and non-parametric tests along with descriptive statistics in contemporary research.

**COURSE OBJECTIVES**

This course will cover:

1. Basic concepts such as random experiments, probability rules and counting methods.
2. Single and multiple random variables (discrete, continuous, and mixed), their distributions as well as moment-generating functions.
3. Limit theorems and convergence.
4. Introduction to mathematical statistics.
5. Random processes including processing of random signals, Poisson processes.
6. Simulation using EXCEL/MegaStat and R.
7. Learn methods of building statistical models.

**TEXT BOOK**

H. Pishro-Nik, *Introduction to Probability, Statistics, and Random Processes*, Kappa Research, 2014. Available online at: https://www.probabilitycourse.com/

**STUDENT EVALUATION**

Home works + Attendance: 10%, Quizzes: 15%, Project: 15%, Midterm: 20%, Final exam: 40%

1. **Home works:** *These are weekly assignments*. *If you don’t show your work, you get a zero. You will be asked (randomly) to present your solutions.*

2. **Quizzes*:*** *There will be 3 quizzes given during the semester. There is no such thing as a make up quiz. If you miss a quiz, you get a zero.*

**EXAMINATION FORMAT**

Quizzes: 30 minutes; Midterm Exam: 90 minutes; Final: 120 minutes.

**GRADING SCALE** A (90-100), B (80-89), C (70-79), D (60-69), F (<60)

**Tentative class schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Date** | **Sections** | **Topics** | **Remarks** |
| 1 | 26-Sep | Ch 1 | Basic concepts |  |
| 2 | 3-Oct | Ch 2 | Combinatorics |  |
| 3 | 10-Oct | Ch 3 | Discrete Random Variables, I |  |
| 4 | 17-Oct |  | Discrete Random Variables, II | Quiz 1 (Ch 1 & 2) |
| 5 | 24-Oct | Ch 4 | Continuous Random Variables, I |  |
| 6 | 31-Oct |  | Continuous Random Variables, II | Quiz 2 (Ch 3) |
| 7 | 7-Nov | Ch 5 | Joint probability distributions  Review for Midterm |  |
| 8 | 14-Nov |  | **Question & Answer** | **Midterm Exam**  (Chapters 2, 3 & 4) |
| 9 | 21-Nov | Ch 7 | Law of large numbers and the central limit theorem |  |
| 10 | 28-Nov | Ch 8 | Interval Estimation |  |
| 11 | 5-Dec |  |  | Quiz 3 (Ch 7) |
| 12 | 12-Dec |  | Linear regression (Add as BONUS: Non-linear regression & Time-series). |  |
| 13 | 19-Dec |  | Hypothesis Tests | Quiz 4 (Ch 8) |
| 14 | 26-Dec |  | Project presentation, Final review |  |
| 15 | 2-Jan |  | **Question & Answer** | **Final Exam** |

**CLASS REGULATION:** Students are expected to:

1. Punctually attend all scheduled classes.
2. Be responsible for all instructions and assignments given in class as well as for the supporting textbook content.
3. Read the textbook material **before** the lecture covering that material and attempt the suggested problems before the material is covered in class.
4. Be an active participant in this class while being respectful of everyone else in the class.
5. **Turn off cell phones when you enter the classroom. If your cell phone rings during class, you will be asked to leave the class.**

**ABSENCES:**

**IF YOU MISS MORE THAN TWO CLASSES--EXCUSED OR UNEXCUSED--YOU WILL RECEIVE A FAILING GRADE** (grade of **“F”**) **FOR THE COURSE.**

***THIS SYLLABUS IS TENTATIVE AND SUBJECT TO CHANGE.*** *The instructor may make changes if deemed necessary. Changes will be announced in class.*