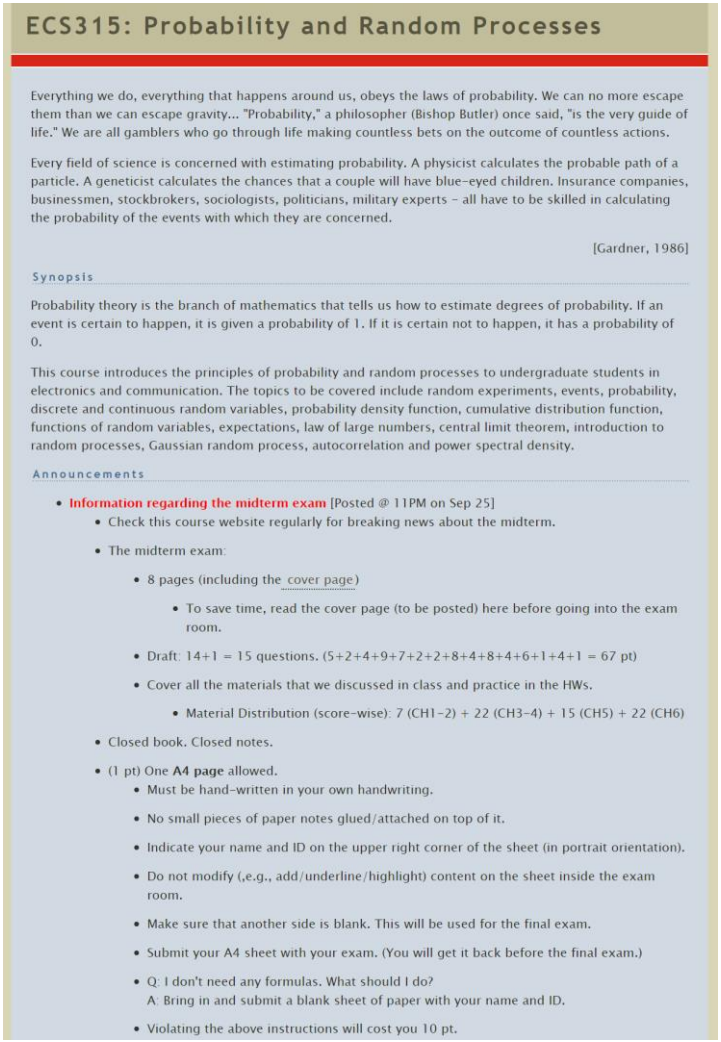
Midterm Exams

- Check the course website regularly for breaking news about the midterm.
- To save time, read the cover page to be posted on the course website before going into the exam room.
- Closed book. Closed notes.
- One A4 page allowed.



ECS315: Probability and Random Processes

Everything we do, everything that happens around us, obeys the laws of probability. We can no more escape them than we can escape gravity... "Probability," a philosopher (Bishop Butler) once said, "is the very guide of life." We are all gamblers who go through life making countless bets on the outcome of countless actions.

Every field of science is concerned with estimating probability. A physicist calculates the probable path of a particle. A geneticist calculates the chances that a couple will have blue-eyed children. Insurance companies, businessmen, stockbrokers, sociologists, politicians, military experts – all have to be skilled in calculating the probability of the events with which they are concerned.

[Gardner, 1986]

Synopsis

Probability theory is the branch of mathematics that tells us how to estimate degrees of probability. If an event is certain to happen, it is given a probability of 1. If it is certain not to happen, it has a probability of 0.

This course introduces the principles of probability and random processes to undergraduate students in electronics and communication. The topics to be covered include random experiments, events, probability, discrete and continuous random variables, probability density function, cumulative distribution function, functions of random variables, expectations, law of large numbers, central limit theorem, introduction to random processes, Gaussian random process, autocorrelation and power spectral density.

Announcements

- **Information regarding the midterm exam** [Posted @ 11PM on Sep 25]
  - Check this course website regularly for breaking news about the midterm.
  - The midterm exam:
    - 8 pages (including the cover page)
      - To save time, read the cover page (to be posted) here before going into the exam room.
    - Draft: 14+1 = 15 questions. (5+2+4+9+7+2+2+8+4+8+4+6+1+4+1 = 67 pt)
    - Cover all the materials that we discussed in class and practice in the HWs.
      - Material Distribution (score-wise): 7 (CH1-2) + 22 (CH3-4) + 15 (CH5) + 22 (CH6)
  - Closed book. Closed notes.
  - (1 pt) One **A4 page** allowed.
    - Must be hand-written in your own handwriting.
    - No small pieces of paper notes glued/attached on top of it.
    - Indicate your name and ID on the upper right corner of the sheet (in portrait orientation).
    - Do not modify (,e.g., add/underline/highlight) content on the sheet inside the exam room.
    - Make sure that another side is blank. This will be used for the final exam.
    - Submit your A4 sheet with your exam. (You will get it back before the final exam.)
    - Q: I don't need any formulas. What should I do?
      A: Bring in and submit a blank sheet of paper with your name and ID.
    - Violating the above instructions will cost you 10 pt.

Cover page

- To save time, read it before going into the exam room.

Name.....ID.....Section.....1.....Seat No.....

Sirindhorn International Institute of Technology
Thammasat University

Midterm Examination: Semester 1 / 2019

Course Title: ECS315 (Probability and Random Processes)

Instructor: Asst. Prof. Dr.Prapun Suksompong

Date/Time: October 3, 2019 / 15:00 - 17:00

Instructions:

- This examination has 8 pages (including this cover page).
- Conditions of Examination:

☐ Open book

☐ Closed book

☑ Semi-Closed book (1 sheet(s) ☑ 1 page ☐ both sides of A4 paper note)

This sheet must be hand-written. They should be **submitted with the exam**.
Do not modify (e.g., add/underline/highlight) content on the sheet inside the exam room.
Indicate your name and ID in the upper-right corner of the sheet (in portrait orientation).
Other requirements are specified on the course website. (-10 pt if not following the requirements.)

☐ Other:.....

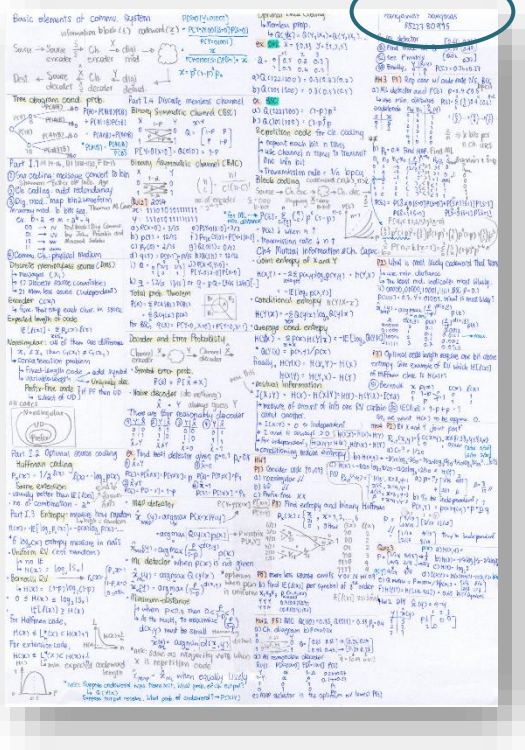
☐ No dictionary ☐ Dictionary allowed ☐ No calculator ☑ Calculator allowed

- **Read these instructions and the questions carefully.**
- Students are not allowed to be out of the examination room during examination. Going to the restroom may result in score deduction.
- Turn off all communication devices and place them with other personal belongings in the area designated by the proctors or outside the test room.
- Write your name, student ID, section, and seat number clearly in the spaces provided on the top of this sheet. Then, write your **first name and the last three digits of your ID** in the spaces provided on the top of each page of your examination paper, starting from page 2.
- The examination paper is not allowed to be taken out of the examination room. Violation will result in a zero (0) score for the examination. Also, do not remove the staple.
- Unless instructed otherwise, ***write down all the steps*** that you have done to obtain your answers.
  - When applying formula(s), state clearly which formula(s) you are applying before plugging-in numerical values.
  - You may not get any credit even when your final answer is correct without showing how you get your answer.
  - Formula(s) not discussed in class can be used. However, derivation must also be provided
  - **Exceptions**:
    - Problems that are labeled with "ENRPr" (Explanation is not required for this problem.)
    - Parts that are labeled with "ENRPa" (Explanation is not required for this part.)
    - These problems/parts are graded solely on your answers. There is no partial credit and it is not necessary to write down your explanation. Usually, spaces (boxes or cells in a table or rows of dashes) will be provided for your answers. "WACSP" stands for "write your answer(s) in the corresponding space(s) provided".
- The back of each page will not be graded; it can be used for calculations of problems that do not require explanation.
- When not explicitly stated/defined, all notations and definitions follow ones given in lecture.
- Some points are reserved for *accuracy* of the answers and also for reducing answers into their *simplest* forms. Watch out for roundoff error. Unless specified otherwise, the error in your final answer should not exceed 0.1%.
  - For counting problem, the answer should be reduced into just an integer.
    Exception: When the answer is more than 10^9, you may leave the answer in some form of simplified expression.
- Points marked with * indicate challenging problems.
- Do not cheat. Do not panic. **Allocate your time wisely.**
- Don't forget to submit your fist online self-evaluation form by the end of today.

This information is posted on the course website.

Midterm Exam: One **A4 page**

- Must be hand-written in your own handwriting.
- No small pieces of paper notes glued/attached on top of it.
- Indicate your name and ID on the upper right corner of the sheet (**in portrait orientation**).
- Do not modify (,e.g., add/underline/highlight) content on the sheet inside the exam room.
- Make sure that another side is blank. This will be used for the final exam.
- Submit your A4 sheet with your exam. (You will get it back before the final exam.)
- Q: I don't need any formulas. What should I do?
  A: Bring in and submit a blank sheet of paper with your name and ID.
- Violating the above instructions will cost you 10 pt.



Some Instructions from the cover page

- Some points are reserved for *accuracy* of the answers and also for reducing answers into their *simplest* forms. Watch out for roundoff error. Unless specified otherwise, the error in your final answer should not exceed 0.1%.
  - For counting problem, the answer should be reduced into just an integer.
    Exception: When the answer is more than 10^9, you may leave the answer in some form of simplified expression.
- Watch out for roundoff error.
  In general, the error in your final answer should not exceed 0.1%.

Some Instructions from the cover page

- Unless instructed otherwise, write down all the steps that you have done to obtain your answers.
- When applying formula(s), state clearly which formula(s) you are applying before plugging-in numerical values.
  - You may not get any credit even when your final answer is correct without showing how you get your answer.
  - Formula(s) not discussed in class/HW can be used. However, derivation must also be provided.
- **Exceptions**:
  - Problems that are labeled with "**ENRPr**" (Explanation is not required for this problem.)
  - Parts that are labeled with "**ENRPa**" (Explanation is not required for this part.)
  - These problems/parts are graded solely on your answers. There is no partial credit and it is not necessary to write down your explanation. Usually, spaces (boxes or cells in a table or rows of dashes) will be provided for your answers. "**WACSP**" stands for "write your answer in the corresponding space provided".

Some Instructions from the cover page

- When not explicitly stated/defined, all notations and definitions follow ones given in lecture.
  - For example, $\mathrm{sinc}(x) = \frac{\sin(x)}{x}$.
- Points marked with * indicate challenging problems.

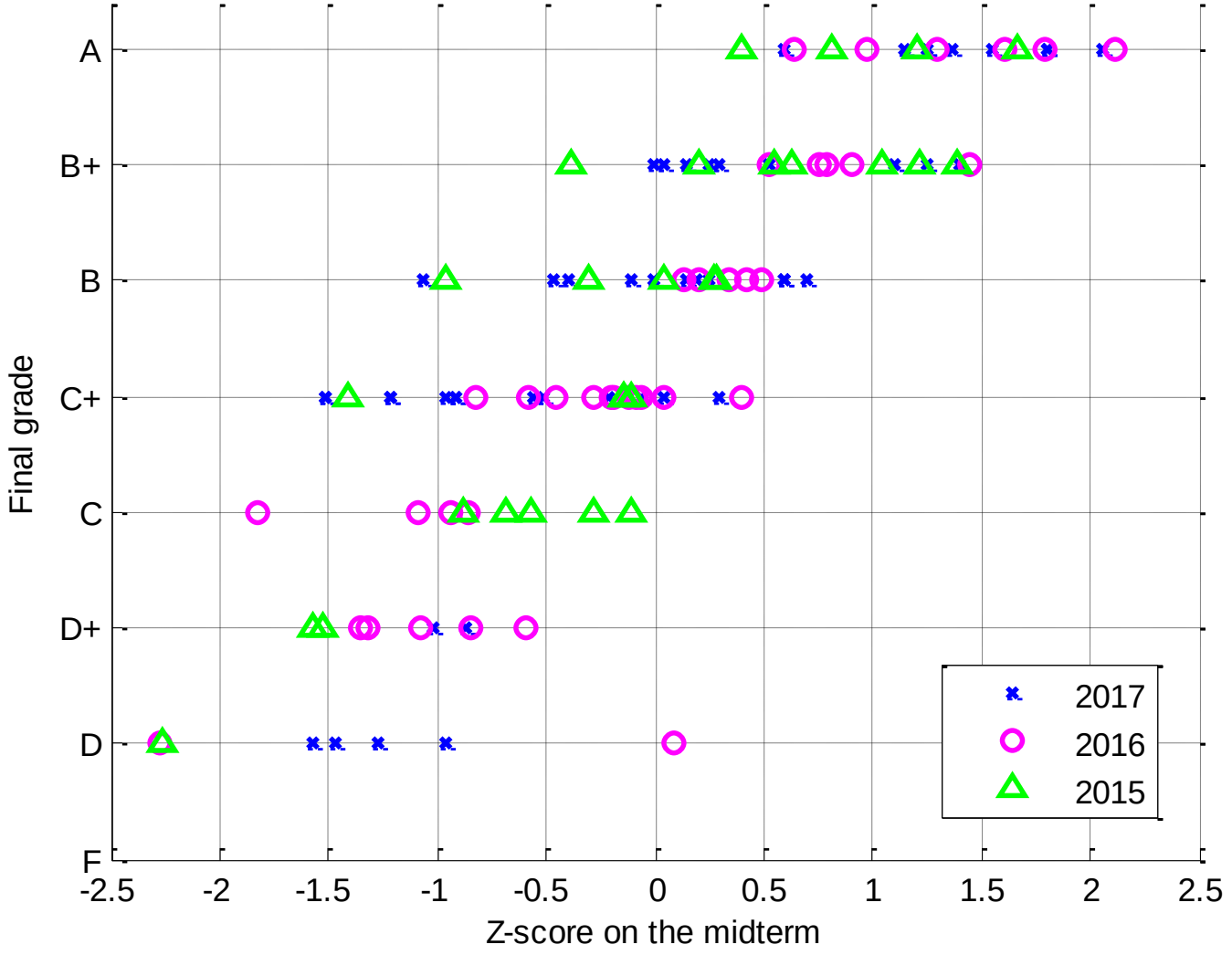
Preparation

- In-class exercises
- Old Exams
- HW
  - Don't forget that we have one free HW whose content is still useful for the exam.
- Lecture notes

ECS 315 Midterm Exam: Tentative Info

- 8 pages (including the cover page)
- Draft: 14+1 = 15 questions.
  (5+2+4+9+7+2+2+8+4+8+4+6+1+4+1 = 67 pt)
- Cover all the materials that we discussed in class and practice in the HWs.
- Material Distribution (score-wise):
  7 (CH1-2) + 22 (CH3-4) + 15 (CH5) + 22 (CH6)

ECS315 History



ECS332 History