Transmission of Information - 17791 - ECE 44000 - 001
BHEE Room 222, 8:30 - 9:20 am MWF
4 Credit Hours
Fall 2022

Prerequisites: ECE 30100, ECE 30200.

Staff:

job	name	office	phone	login
lecturer	James V. Krogmeier	MSEE 326	494-3530	`jvk`
lab TA	Kyle Evans			`evans466`

Office Hours:

- K. Evans will hold weekly open lab hours in the ECE 44000 Lab, Room Potter 264, at times to be determined and announced later.
- J. V. Krogmeier will usually be available after class on Mondays and Wednesdays or by e-mail appointment.

Cat. Desc.: Analysis and design of Analog and Digital Communication Systems. Emphasis on engineering applications of theory to communication system design. The laboratory introduces the use of advanced engineering workstations in the design and testing of communication systems.

Text: R. E. Ziemer and W. H. Tranter, *Principles of Communications*, 7th edition, Wiley, 2015.

Web: `https://engineering.purdue.edu/~jvk/440f22/fall22.html`

Lab: The laboratory is Potter Room 264. You must do the labs during your assigned period each week. Because you receive one hour of lab credit, you will fail the course unless you attend lab and attempt to perform the experiments. See the lab TA for lab documents, procedures, and schedules.

HW: Homework will be assigned every week or two depending on lecture progress and the examination schedule. It should be turned in via gradescope by the time and date indicated on each assignment. Some problems will be graded in detail and others will be merely checked off. For your own benefit, please attempt the problems before consulting with your friends. In any case, the final writeup of the homework must be your own.

Exams: There will be three in-class 50 minute exams and a final exam. All exams will be closed book. The 50 minute exams are:

- Friday, Sept. 23, 2022.
- Friday, Oct. 21, 2022.
- Friday, Nov. 18, 2022.

Material to be covered will be announced in class at least one week in advance.

No makeup exams will be given and it will not be possible to take an exam early. A student wishing to miss an exam must request permission in advance. Such requests will be considered on a case by case basis. See the grading policy described below.

Regrades: Regrade requests on any graded exercise must be submitted via gradescope within one week of the date when the material was returned to the class. Regrade requests cut both ways–if the staff made a mistake in your favor they can take back the points.

Grades: An overall score will be computed using the algorithm below.

(a) All 50-minute exams that you did not take are replaced by the final exam after mean and variance normalization (assuming permission has been granted in advance).

(b) Then the overall score is computed as:

$$\begin{aligned}\text{overall score} \quad = \quad & .25 * \text{lab} + .10 * \text{homework} + .40 * \text{average of 50-minute exams} \\ & + .25 * \text{final exam}\end{aligned}$$

The course will **not** use the plus-minus grading system. Your final letter grade will be determined by rank ordering according to the overall score and applying a letter grade curve.

In the event of a major campus emergency, course requirements, deadlines, and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances.

The laboratory for this course is extremely important. Students who fail to complete multiple labs usually fail the course. The TAs will outline policies for attendance and completion of lab course work.

Covid, Etc.: Students are expected to attend all classes in-person unless they are ill or otherwise unable to attend class. If you feel ill or need to quarantine we will work with you. Please reach out to me and keep track of the latest policies on the Protect Purdue web page:

`https://protect.purdue.edu/`

PPP: Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights and the Violent Behavior Policy under University Resources in Brightspace.

Learning Os: *A student who successfully fulfills the course requirements will have demonstrated:*

i) an ability to recognize and analyze in the time and frequency domain the performance of amplitude and frequency modulated analog communications systems in the presence of noise.

ii) an ability to understand the importance, computation, and measurement using modern test equipment of standard performance measures of analog systems, which include bandwidth and signal to noise ratio.

iii) an ability to recognize and analyze in the time and frequency domains the performance of various digital modulation formats, including ASK, QAM, PSK, and FSK in the presence of noise.

iv) an ability to understand the importance, computation, and measurement using modern test equipment of standard performance measures of digital systems which include bandwidth and bit error probability.

v) an understanding of the basics of information theory and error control codes including the effect of error control codes on the bandwidth and bit error probability of digital systems.

Cheating: The School is very concerned about cheating. Most of the following is nearly verbatim from the School of ECE statement on cheating, which was sent to the faculty in January 1999.

The Purdue community expects every member of the community to practice honorable and ethical behavior both inside and outside the classroom. Any actions that might unfairly improve a student's score on homework, quizzes, examinations, or labs will be considered cheating and will not be tolerated.

Homework: The only requirement is that whatever you turn in is something that you wrote up (by hand or by computer) yourself. Working in groups is fine. Most of the problems are old exam problems. This means two things:

(a) There are solutions around.

(b) If you can't work these problems by yourself then you will find that the exams are very hard. Furthermore, the only way to make sure that you can work them by yourself is to actually work them by yourself. This is a variant on "no pain, no gain"!

If you have questions please ask.

Exams: The list of things not to do includes, but is not limited to:

(a) Share results or other information during an exam.

(b) Bring forbidden notes or devices (e.g., calculators) to an exam.

(c) Work on an exam before or after the official time.

(d) Share questions, results, answers, or other information with someone who has not yet taken the exam.

(e) Request a regrade of work that has been altered.

If you have questions please ask.

Lab: You must

(a) Show up to lab.

(b) Do the experiments.

(c) Write up the lab yourself in consultation, if desired, with your lab partner.

(d) The write up must reflect the data you measured in lab.

For the lab quizzes and lab practical the "exam" rules apply. If you have questions please ask.

At the instructor's discretion, cheating on an assignment or examination will result in a reduced score, a zero score, or a failing grade for the course. All occurrences of academic dishonesty will be reported to the Assistant Dean of Students and copied to the ECE Assistant Head for Education. If there is any question as to whether a given action might be construed as cheating, please see the instructor or the teaching assistant before you engage in any such action.