



Sirindhorn International Institute of Technology
Thammasat University
School of Information, Computer and Communication Technology

ECS 332: Course Syllabus

Semester/Year: 1/2015

Course Title: Principles of Communications

Instructor: Asst. Prof. Dr.Prapun Suksompong (prapun@siit.tu.ac.th)

Course Web Site: <http://www2.siiit.tu.ac.th/prapun/ecs332/>

Please check the course web site regularly for updated information about this course.

Lectures

Time and Place:

- Tuesday 10:40-12:00 BKD 2601
- **Wednesday 09:20-10:20 BKD 2601(Tutorial/Quiz/Make-up; Shared with ECS315)**
- Thursday 13:00-14:20 BKD 2506

You are STRONGLY encouraged to attend lectures. (See the grading policy below.)

Undergraduate Student Dress Code: Thammasat University uniform OR polite dress.

- Plain white shirt with collar, properly tucked in.
- Plain trouser/skirt in dark color.
- Sandals are not allowed (during official hours on campus)

Remark: When taking examinations, all SIIT students are required to wear TU student uniforms and dress/sport shoes in plain (white, black, brown, or navy blue) color.

Prerequisite: ECS281 Signals and Systems

Corequisite: ECS 315 (Probability and Random Processes)
or IES 302 (Engineering Statistics)

Course Description: This course introduces the fundamental elements of analog and digital communication systems. The focus will be on the mathematical analysis of the signals and basic building blocks of communication systems. Performance of digital communication systems in the presence of noise will be discussed towards the end. The skills and knowledge gained from this class are essential for other advanced communication courses such as, data communications, computer network, digital communication systems, and mobile communications.

Textbook: [C&C] A. Bruce Carlson and Paul B. Crilly, Communication Systems: An Introduction to Signals and Noise in Electrical Communication, McGraw-Hill, 2010, 5th International edition. Call No. TK5102.5 C3 2010. ISBN: 978-007-126332-0.

References:

1. [Z&T] Rodger E. Ziemer and William H. Tranter, Principles of Communications, 6th International student edition, John Wiley & Sons Ltd, 2010. Call No. TK5105 Z54 2010.
2. [L&D] B.P. Lathi and Zhi Ding, Modern Digital and Analog Communication Systems, 4th Edition, Oxford: Oxford University Press, 2009. Call No. TK5101 L333 2009
3. J. G. Proakis and M. Salehi, Communication Systems Engineering, 2nd Edition, Prentice Hall, 2002. ISBN: 0-13-095007-6
4. S.S. Haykin, Communication Systems, 4th Edition, John Wiley & Sons, 2001. Call Number: TK5101 H38 2001.

Grading Policy: Coursework will be weighted as follows:

Assignments	5%
Quiz	5%
Class Discussion/Participation	10%
Midterm Examination	40%
Final Examination (comprehensive)	40%

- Late assignments will be heavily penalized or rejected.
- Cheating will not be tolerated
- Copying homework/quiz/exam = cheating
 - First time cheater receives zero on that assignment
 - Second time cheater receives zero on all quizzes and/or HWs

Assignments: Homework will be assigned throughout the semester. For each assignment, only part(s) of a selected problem will be graded. Of course, you do not know which problem will be selected; so you should work on all of them. The complete solutions to all problems will be posted on the course web site.

Quizzes and Exams:

Exams will be closed book.

Quizzes will test current and previous topics. A quiz may be given at any time during any class period – at the beginning or end of a class, etc. There will be no make-up quizzes. Quizzes will be given only to those students who are present when the quizzes are distributed. Tutorial slot(s) can also be used for pre-announced quizzes.

Students should notify the instructor before missing any exam if at all possible and immediately thereafter when not possible. The instructor (and/or the fact-finding committee) will determine if the absence from an exam is legitimate. Simply not feeling well is not a reason to miss an exam. In the case of legitimate absence, an oral and/or written make-up exam could be arranged.

Expectations: You should expect to spend extra 5-8 hours per week studying outside of class. However, I do expect you to come to class and participate actively in class discussions. If you must miss a class, I expect you to find out and catch up with what happened in lecture, either from me or one of your classmates. You are responsible for all materials that are discussed in class.

Academic Integrity

The work you submit in ECS 332 is expected to be the result of your individual effort. You are free to discuss course material, approaches to problems with your colleagues or the instructor but you should never misrepresent someone else's work as your own.

It is your responsibility to protect your work from unauthorized access. For example, do not discard copies of your codes/assignments in public places.

Course Outline

The following is a tentative list of topics.

1. Introduction to communication systems
2. Frequency domain analysis (Fourier transform and its property)
3. Frequency-shifting (translation) and channel characteristics
4. Modulation, multiplexing, DSB-SC
5. Fourier series and its applications in analyzing modulator and demodulator
6. Quadrature Amplitude Modulation (QAM), Amplitude Modulation (AM), and envelope detector
7. Angle modulation, instantaneous frequency
8. **MIDTERM: 5 Oct 2015 TIME 09:00 - 12:00**
9. Sampling and aliasing
10. Analog pulse modulation and pulse shaping
11. Introduction to digital communications and digitization
12. Review of theory of probability and random processes
13. Source coding and entropy
14. Digital communication in the presence of noise, binary symmetric channel, detectors
15. Error probability and optimal detectors
16. Channel coding
17. **FINAL: 11 Dec 2015 TIME 09:00 - 12:00**