

Digital Communication Systems

ECS 452

Asst. Prof. Dr. Prapun Suksompong
(ผศ.ดร.ประพันธ์ สุขสมpong)

prapun@siit.tu.ac.th

Introduction



Office Hours:

BKD, 6th floor of Sirindhralai building

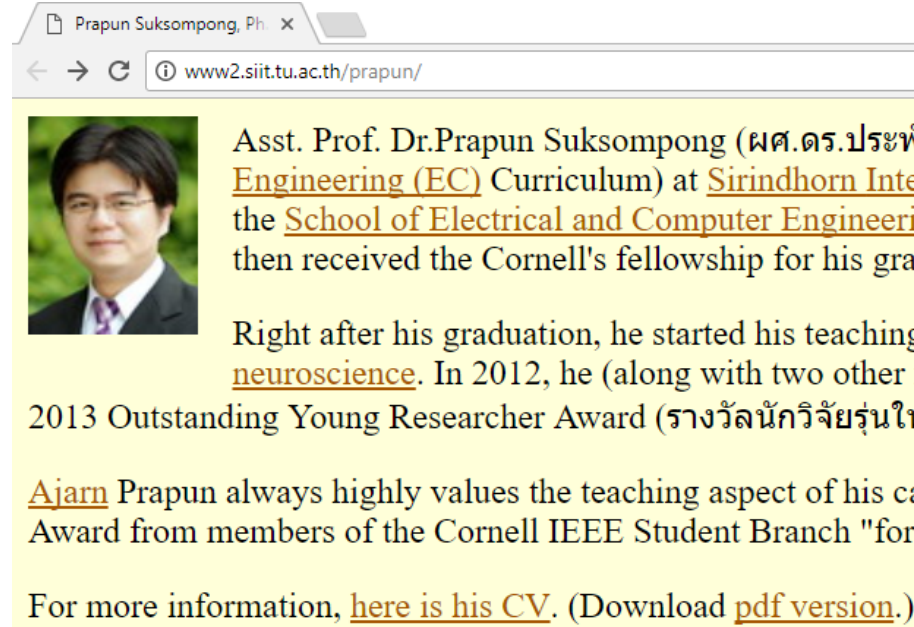
Monday 10:00-10:40

Tuesday 12:00-12:40

Thursday 14:20-15:30

Course Web Site

prapun.com



Prapun Suksompong, Ph.D.

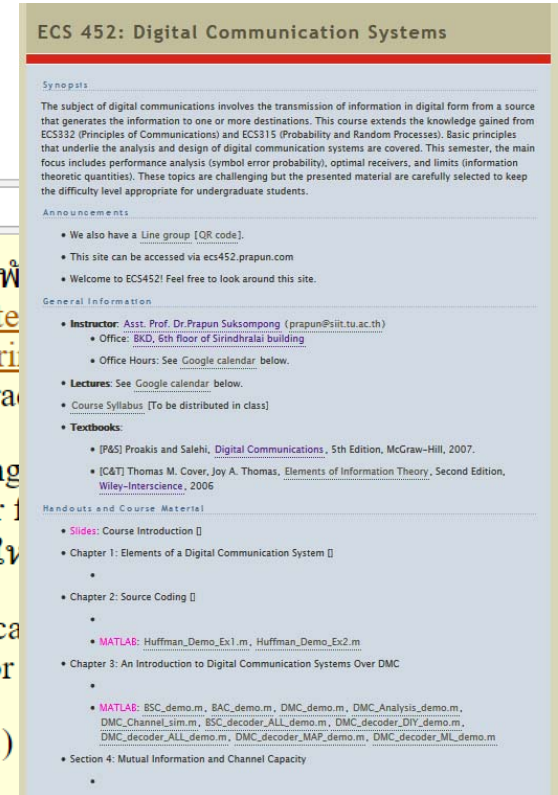
www2.siiit.tu.ac.th/prapun/

Asst. Prof. Dr. Prapun Suksompong (ผศ.ดร.ประพจน์ วิศวกรรม (EC) Curriculum) at Sirindhorn International School of Electrical and Computer Engineering then received the Cornell's fellowship for his graduate studies.

Right after his graduation, he started his teaching in neuroscience. In 2012, he (along with two other faculty members) received the 2013 Outstanding Young Researcher Award (รางวัลนักวิจัยรุ่นใหม่).

Ajarn Prapun always highly values the teaching aspect of his career. He received the 2013 Outstanding Young Researcher Award from members of the Cornell IEEE Student Branch "for his contribution to the field of digital communication systems."

For more information, [here is his CV](#). (Download [pdf version](#).)



ECS 452: Digital Communication Systems

Synopsis

The subject of digital communications involves the transmission of information in digital form from a source that generates the information to one or more destinations. This course extends the knowledge gained from ECS332 (Principles of Communications) and ECS315 (Probability and Random Processes). Basic principles that underlie the analysis and design of digital communication systems are covered. This semester, the main focus includes performance analysis (symbol error probability), optimal receivers, and limits (information theoretic quantities). These topics are challenging but the presented material are carefully selected to keep the difficulty level appropriate for undergraduate students.

Announcements

- We also have a Line group [QR code].
- This site can be accessed via ecs452.prapun.com
- Welcome to ECS452! Feel free to look around this site.

General Information

- Instructor:** Asst. Prof. Dr. Prapun Suksompong (prapun@siiit.tu.ac.th)
 - Office: BKD, 6th floor of Sirindhralai building
 - Office Hours: See Google calendar below.
- Lectures:** See Google calendar below.
- Course Syllabus:** [To be distributed in class]
- Textbooks:**
 - [P&S] Proakis and Salehi, *Digital Communications*, 5th Edition, McGraw-Hill, 2007.
 - [C&T] Thomas M. Cover, Joy A. Thomas, *Elements of Information Theory*, Second Edition, Wiley-Interscience, 2006

Handouts and Course Material

- Slides: Course Introduction []
- Chapter 1: Elements of a Digital Communication System []
- Chapter 2: Source Coding []
- MATLAB: Huffman_Demo_Ex1.m, Huffman_Demo_Ex2.m
- Chapter 3: An Introduction to Digital Communication Systems Over DMC
- MATLAB: BSC_demo.m, BAC_demo.m, DMC_demo.m, DMC_Analysis_demo.m, DMC_Channel_sim.m, BSC_decoder_ALL_demo.m, DMC_decoder_DIY_demo.m, DMC_decoder_ALL_demo.m, DMC_decoder_MAP_demo.m, DMC_decoder_ML_demo.m
- Section 4: Mutual Information and Channel Capacity

Teaching

Current version



- For 2/2017, he teaches
 - [ECS452 \(Digital Communication Systems\)](#)
- For 1/2017, he taught
 - [ECS315 \(Probability and Random Processes\)](#)
 - [ECS332 \(Principles of Communications\)](#)

Earlier version



- For 2/2016, he taught
 - [ECS452 \(Digital Communication Systems\)](#)
 - [ECS455 \(Mobile Communications\)](#)
- For 1/2016, he taught

Course Organization

- **Course Website:**

<http://www2.siit.tu.ac.th/prapun/ecs452/>

- **Lectures:**

- **Tuesday 10:40-12:00 BKD 3511**

- **Thursday 10:40-12:00 BKD 3511**

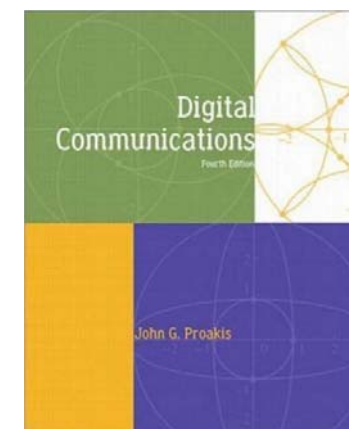
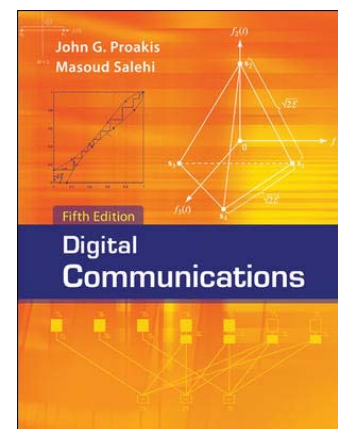
- **Textbook: Digital Communications**

- **By John Proakis and Masoud Salehi**

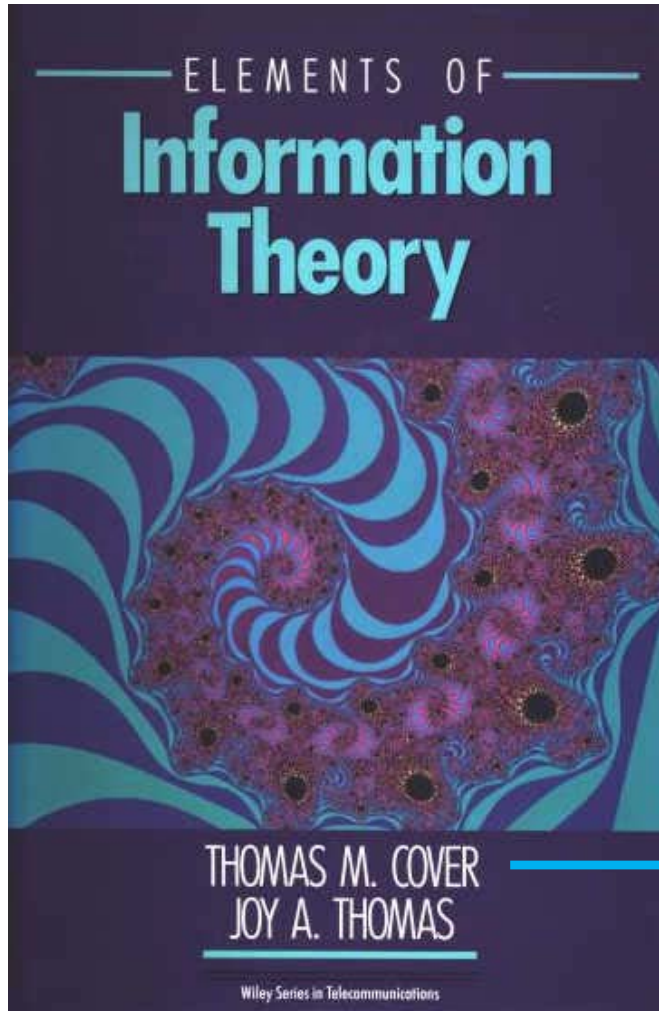
- **Northeastern University**

- **5th (International) Edition**

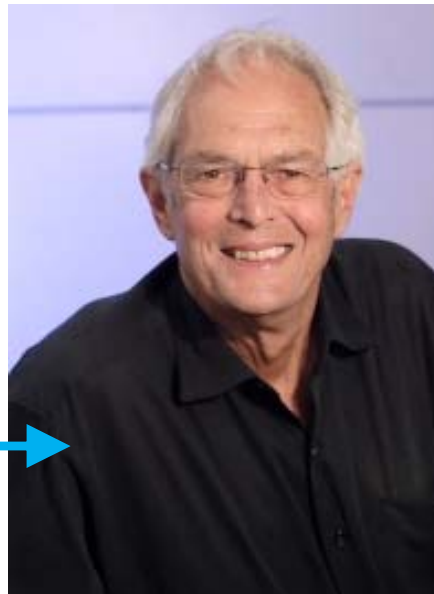
- **Call No. TK5103.7 P76 2008**



Additional Reference



- Elements of Information Theory
- 2006, 2nd Edition



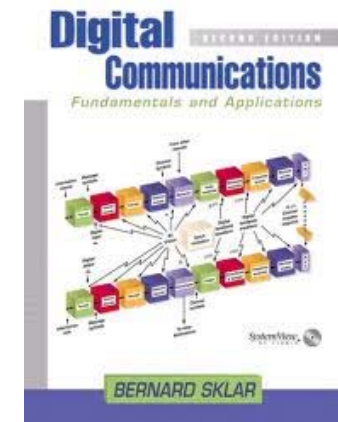
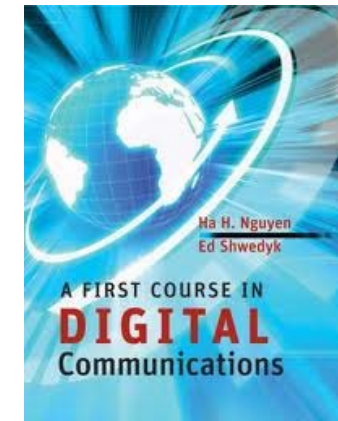
‘the jewel in Stanford's crown’

One of the greatest information theorists since Claude Shannon (and the one most like Shannon in approach, clarity, and taste).

(August 7, 1938 – March 26, 2012)

Additional References

- A first course in digital communications
 - By Ha H. Nguyen and Ed Shwedyk
 - Call No: TK5103.7 N49 2009
 - Cambridge University Press
- Digital communications: fundamentals and applications
 - By Bernard Sklar.
 - Call No: TK5103.7 S55 2001
 - Prentice Hall
- Principles of Digital Communication
 - By Robert G. Gallager
 - 2008
 - Cambridge University Press



Robert G Gallager



Calendar

M	T	W	R	F
8-Jan-18	9-Jan-18	10-Jan-18	11-Jan-18	12-Jan-18
15-Jan-18	16-Jan-18	17-Jan-18	18-Jan-18	19-Jan-18
22-Jan-18	23-Jan-18	24-Jan-18	25-Jan-18	26-Jan-18
29-Jan-18	30-Jan-18	31-Jan-18	1-Feb-18	2-Feb-18
5-Feb-18	6-Feb-18	7-Feb-18	8-Feb-18	9-Feb-18
12-Feb-18	13-Feb-18	14-Feb-18	15-Feb-18	16-Feb-18
19-Feb-18	20-Feb-18	21-Feb-18	22-Feb-18	23-Feb-18
26-Feb-18	27-Feb-18	28-Feb-18	1-Mar-18	2-Mar-18
5-Mar-18	6-Mar-18	7-Mar-18	8-Mar-18	9-Mar-18
12-Mar-18	13-Mar-18	14-Mar-18	15-Mar-18	16-Mar-18
19-Mar-18	20-Mar-18	21-Mar-18	22-Mar-18	23-Mar-18
26-Mar-18	27-Mar-18	28-Mar-18	29-Mar-18	30-Mar-18
2-Apr-18	3-Apr-18	4-Apr-18	5-Apr-18	6-Apr-18
9-Apr-18	10-Apr-18	11-Apr-18	12-Apr-18	13-Apr-18
16-Apr-18	17-Apr-18	18-Apr-18	19-Apr-18	20-Apr-18
23-Apr-18	24-Apr-18	25-Apr-18	26-Apr-18	27-Apr-18
30-Apr-18	1-May-18	2-May-18	3-May-18	4-May-18
7-May-18	8-May-18	9-May-18	10-May-18	11-May-18
14-May-18	15-May-18	16-May-18	17-May-18	18-May-18
21-May-18	22-May-18	23-May-18	24-May-18	25-May-18
28-May-18	29-May-18	30-May-18	31-May-18	1-Jun-18

Add – drop period

Lectures

Exams

Withdrawal deadline

Please Double-Check Exam Dates!

Grading System

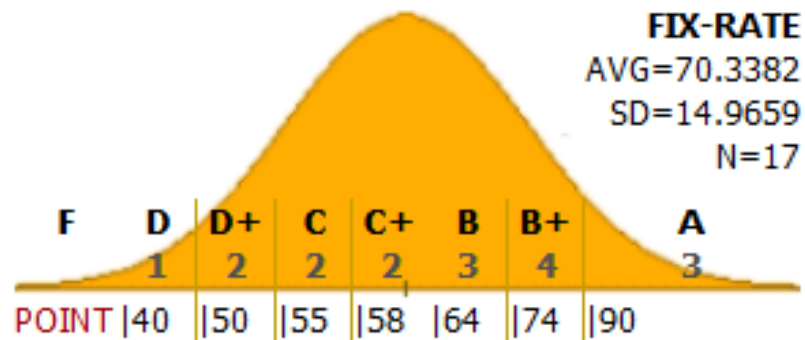
- Coursework will be weighted as follows:

Assignments	5%
Class Discussion	5%
In-Class Exercises	10%
Midterm Examination	35%
Final Examination (comprehensive)	45%

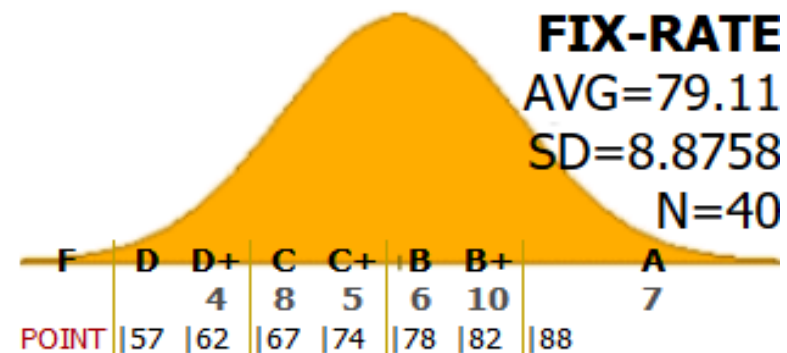
- Late HW submission will be rejected.



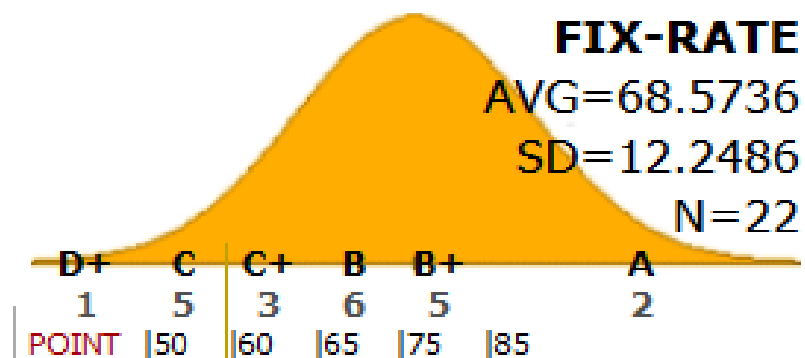
Grading System



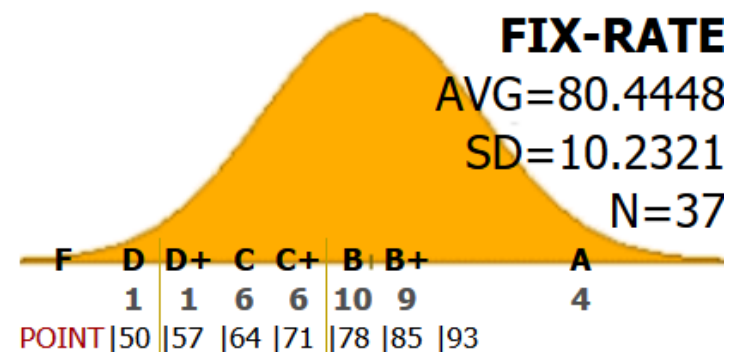
2013: CLASS GPA: 2.82



2015: CLASS GPA: 2.89



2014: CLASS GPA: 2.84



2016: CLASS GPA.: 2.89