



## Course Profile

### Degree Program:

- ECE-Electrical & Computer Engineering  
 ME -Mechanical Engineering  
 General Courses for Both ECE & ME Degree Programs

Course Name: Digital Communications and Coding

Course Code: VE455

Course Credits: 4 for undergraduate, 3 for graduate

Course Category:  Elective for graduate students  Elective for undergraduate students

### Terms Offered:

- Fall 2016 (YYYY-YYYY)  
 Spring \_\_\_\_\_ (YYYY-YYYY)  
 Summer \_\_\_\_\_ (YYYY-YYYY)

### Class Location:

Dong Xia Yuan 201 (Tuesday)  
Dong Xia Yuan 207 (Thursday and Friday)  
Dong Xia Yuan 110 (for the makeup classes)

### Class Time:

Tuesday: 4:00-5:40 pm  
Thursday: 4:00-5:40 pm  
Friday: 10:00-11:40 am (Odd week only)

### Course Pre/Co-requisites:



Probability, Linear Systems, Digital Signal and Systems

Textbook:

<b>Required Texts &amp; Materials</b>	1. John G. Proakis and Masoud Salehi, Digital Communications, 5 <sup>th</sup> Edition, McGraw-Hill
<b>Suggested Texts, Readings, &amp; Materials</b>	1. Tom M. Cover and Joy A. Thomas, Elements of Information Theory, Wiley.

Instructor:

Prof. Xudong Wang

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Office Phone: 34207221

Office Room: 214

Office Hours: by appointment

Teaching Assistants:

Name: Peng Shi

Email: [peng.shi@sjtu.edu.cn](mailto:peng.shi@sjtu.edu.cn)

Recitation/Q&A: Thursday evening. Pay attention to the announcement about the place.

Grading Policy:

<b>Homework</b>	<b>16%</b>
<b>Attendance</b>	<b>4%</b>
<b>Mid-Exams</b>	<b>25%, 25%</b>
<b>Final Exam</b>	<b>30%</b>



## Academic Integrity:

1. Students are required to obey the honor code as regulated by UM-SJTU Joint Institute and SJTU. Violation of the honor code will be reported to the honor council.
2. Students must carefully follow Joint Institute' exam room regulations.
3. Students must arrive on time and are not allowed to leave during class unless it is approved by the instructor.
4. Students are encouraged to attend each class. Absence from classes for more than twice will trigger deduction of final grade (1point per class).
5. All homework assignments must be submitted on time. Homework must be completed by a student independently, although discussion and collaborations are allowed. Copying homework is a violation of the honor code.
6. Cell phones must be silent in class. No web browsing is allowed unless it is advised to do so by the instructor. No food is allowed in class, but is allowed during break time.

## Detailed Schedule:

Weeks	Dates	Time	Contents
Week 1	Sept 13	4:00-5:40 pm	Introduction to digital communications and coding
	Sept 15	4:00-5:40 pm	<i>No class due to holiday</i>
	Sept 18	10:00-11:40 am	Random processes for digital communications (for Friday's class)
Week 2	Sept 20	4:00-5:40 pm	Random process <i>Homework 1</i>
	Sept 22	4:00-5:40 pm	Information and entropy
	Sept 23	10:00-11:40 am	<i>No class on even week</i>
Week 3	Sept 27	4:00-5:40 pm	Information and entropy <i>Homework 2</i>
	Sept 29	4:00-5:40 pm	Source coding
	Sept 30	10:00-11:40 am	Source coding ( <i>rescheduled to Sept. 23, to be approved</i> )
Week 4	Oct 4	4:00-5:40 pm	<i>No class, due to holiday</i>
	Oct 6	4:00-5:40 pm	<i>No class due to holiday</i>



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	<b>Oct 7</b>	10:00-11:40 am	<i>No class on even week</i>
<b>Week 5</b>	<b>Oct 11</b>	4:00-5:40 pm	Mid-term exam 1 review
	<b>Oct 13</b>	4:00-5:40 pm	<b>Mid-term exam 1</b> <i>Homework 3</i>
	<b>Oct 14</b>	10:00-11:40 am	Channel models
<b>Week 6</b>	<b>Oct 18</b>	4:00-5:40 pm	Capacity of a channel
	<b>Oct 20</b>	4:00-5:40 pm	Capacity of a channel <i>Homework 4</i>
	<b>Oct 21</b>	10:00-11:40 am	<i>No class on even week</i>
<b>Week 7</b>	<b>Oct 25</b>	4:00-5:40 pm	Digital modulation: basic mechanisms
	<b>Oct 27</b>	4:00-5:40 pm	Digital modulation schemes
	<b>Oct 28</b>	10:00-11:40 am	Digital modulation schemes
<b>Week 8</b>	<b>Nov 1</b>	4:00-5:40 pm	Digital modulation schemes
	<b>Nov 3</b>	4:00-5:40 pm	Digital modulation schemes <i>Homework 5</i>
	<b>Nov 4</b>	10:00-11:40 am	<i>No class on even week</i>
<b>Week 9</b>	<b>Nov 8</b>	4:00-5:40 pm	Digital modulation schemes ( <i>rescheduled to Oct 21, to be approved</i> )
	<b>Nov 10</b>	4:00-5:40 pm	Communication system demo
	<b>Nov 11</b>	10:00-11:40 am	<b>Mid-term exam 2</b>
<b>Week 10</b>	<b>Nov 15</b>	4:00-5:40 pm	Analysis of digital modulation
	<b>Nov 17</b>	4:00-5:40 pm	Analysis of digital modulation <i>Homework 6</i>
	<b>Nov 18</b>	10:00-11:40 am	<i>No class on even week</i>
<b>Week 11</b>	<b>Nov 22</b>	4:00-5:40 pm	Block channel coding
	<b>Nov 24</b>	4:00-5:40 pm	Block channel coding
	<b>Nov 25</b>	10:00-11:40 am	Block channel coding <i>Homework 7</i>
<b>Week 12</b>	<b>Nov 29</b>	4:00-5:40 pm	Block channel coding
	<b>Dec 1</b>	4:00-5:40 pm	Block channel coding
	<b>Dec 2</b>	10:00-11:40 am	<i>No class on even week</i>
<b>Week 13</b>	<b>Dec 6</b>	4:00-5:40 pm	Block channel coding <i>Homework 8</i>
	<b>Dec 8</b>	4:00-5:40 pm	Optimal receivers
	<b>Dec 9</b>	10:00-11:40 am	Q&A sessions for final exam
<b>Week 14</b>	<b>Dec 13</b>	4:00-5:40 pm	<b>Final exam</b>
<b>Remarks</b>	Please be aware of any change in the schedule.		