



**East China Normal University  
GEC International Summer School**

**MAT 24: Discrete Mathematics**

**Term: June 16<sup>th</sup> to July 18<sup>th</sup>, 2025**

**Class Hours: Monday through Friday, 110 minutes each day (2,750 minutes in total)**

**Instructor: He Mu**

**Home Institution: Xi'an Jiaotong-liverpool University**

**Office hours: TBD**

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***Course Description***

This course focuses on the part of mathematics devoted to discrete means (consisting of distinct or unconnected elements.) More generally, discrete mathematics is used whenever objects are counted, when relationships between finite (or countable) sets are studied, and when processes involving a finite number of steps are analyzed. A key reason for the growth in the importance of discrete mathematics is that information is stored and manipulated by computing machines in a discrete fashion.

*Prerequisite: None*

***Required Text***

*Discrete Mathematics and its Application, 7th Edition*, by Kenneth H. Rosen

**ISBN: 978-0-07-338309-5**

***Course Hours***

The course has 25 class sessions in total. Each class session is 110 minutes in length, for a total of 2750 minutes of in-class time. The course meets from Monday to Friday. ECNU awards 3 credits for this course. Different universities may count course credits differently. Consult officials at your own home institution.



## ***Attendance***

Summer school is very intense and to be successful, students need to attend every class. Occasionally, due to illness or other unavoidable circumstance, a student may need to miss a class. ECNU policy requires a medical certificate to be excused. Any absence may impact on the student's grade. Moreover, ECNU policy is that a student who has more than 3 absences will fail the course. Arriving late or leaving early will count as a partial absence.

## ***Grading Policy***

ECNU awards grades of A, A-, B+, B, B-, C+, C, D, and F. Most colleges and universities do not award transfer credit for grades of D or F.

In this course, grading will be based on the following:

Attendance and Participation	5%
Assignments*5	5%*5=25%
Midterm Exam	30%
Final Exam	40%

## ***General Expectations***

Students are expected to:

- Attend all classes and be responsible for all material covered in class and otherwise assigned. Any unexcused absence may impact a student's grade.
- Arrive to class on-time: Late arrivals are disruptive to your fellow students and to the conduct of the class.
- Complete the day's required reading and assignments before class
- Review the previous day's notes before class; make notes about questions you have about the previous class or the day's reading
- Refrain from texting, phoning or engaging in computer activities unrelated to class during class (不要用手机) It is highly disrespectful to the professor and to the class.
- Participate in class discussions and complete required written work on time.



## ***Course Schedule***

The planned schedule sketched out below may be modified to suit the interests or abilities of the enrolled students or to take advantage of special opportunities or events that may arise during the term.

### *Week 1*

- *Day 1*
  - *Course outline*
  - *The Foundations: Logic and Proofs (Chapter 1)*
- *Day 2*
  - *Basic Structures: Sets, Functions, Sequences, Sums, and Matrices (Chapter 2)*
- *Day 3*
  - *Basic Structures: Sets, Functions, Sequences, Sums, and Matrices (Chapter 2, continued)*
- *Day 4*
  - *Algorithms (Chapter 3)*
- *Day 5*
  - *Assignment 1 due*
  - *Number Theory and Cryptography (Chapter 4)*

### *Week 2*

- *Day 1*
  - *Number Theory and Cryptography (Chapter 4, continued)*
- *Day 2*
  - *Induction and Recursion (Chapter 5)*
- *Day 3*
  - *Counting (Chapter 6)*
- *Day 4*
  - *Counting (Chapter 6, continued)*
- *Day 5*
  - *Assignment 2 due*
  - *Discrete Probability (Chapter 7)*

### *Week 3*

- *Day 1*
  - *Midterm review session*



- Day 2
  - o Midterm exam, covering Chapters 1-7
- Day 3
  - o Advanced Counting Techniques (Chapter 8)
- Day 4
  - o Advanced Counting Techniques (Chapter 8, continued)
- Day 5
  - o Assignment 3 due
  - o Relations (Chapter 9)

#### Week 4

- Day 1
  - o Relations (Chapter 9, continued)
- Day 2
  - o Graphs (Chapter 10)
- Day 3
  - o Graphs (Chapter 10, continued)
- Day 4
  - o Graphs (Chapter 10, continued)
  - o Trees (Chapter 11)
- Day 5
  - o Trees (Chapter 11, continued)

#### Week 5

- Day 1
  - o Boolean Algebra (Chapter 12)
- Day 2
  - o Modeling Computation (Chapter 13)
- Day 3
  - o Modeling Computation (Chapter 13, continued)
  - o Final review session
- Day 4
  - o Final review session
- Day 5
  - o Final exam
  - o Assignment 5 due



### ***Academic Honesty***

Students are expected to maintain high standards of academic honesty. Specifically, unless otherwise directed by the professor, students may not consult other students, books, notes, electronic devices or any other source, on examinations. Failure to abide by this may result in a zero on the examination, or even failure in the course.