0. Class Meeting Times/Places

1. Lecture: Monday/Wednesday/Friday 10:30 – 11:20 am; Life Science West 201

1. General Information

<table>
<thead>
<tr>
<th>Instructor: H. K. Dai</th>
<th>Teaching Assistant: P. Ishola</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Location:</td>
<td></td>
</tr>
<tr>
<td>Mathematics, Statistics, and Computer Science Building</td>
<td></td>
</tr>
<tr>
<td>Room 209</td>
<td>Room 116</td>
</tr>
<tr>
<td>Office Hours:</td>
<td></td>
</tr>
<tr>
<td>Tuesday/Thursday 4:30 – 5:30 pm</td>
<td>Monday/Wednesday 12:00 – 1:00 pm</td>
</tr>
<tr>
<td>Office Phone:</td>
<td></td>
</tr>
<tr>
<td>744-7207</td>
<td></td>
</tr>
<tr>
<td>email Address:</td>
<td></td>
</tr>
<tr>
<td><a href="mailto:dai@cs.okstate.edu">dai@cs.okstate.edu</a></td>
<td><a href="mailto:peace.o.ishola@okstate.edu">peace.o.ishola@okstate.edu</a></td>
</tr>
</tbody>
</table>

2. Course Description in Current University Catalog

CS 3653: Discrete Mathematics. Prerequisites: MATH 2144 (Calculus I). Theory and applications of discrete mathematical models fundamental to analysis of problems in computer science. Set theory, formal logic and proof techniques, relations and functions, combinatorics and probability, undirected and directed graphs, Boolean algebra, switching logic.

3. Course Goals

Discrete Mathematics deals with computations involving a finite/discrete number of steps, rather than a limiting process. Discrete mathematics supports many areas of computer science (design and analysis of algorithms, complexity theory, artificial intelligence, programming languages, etc.) and many branches of mathematics (combinatorics, graph theory, combinatorial optimization, number theory, coding theory, etc.).

4. Course Materials and References


5. Course Website and Lecture Notes

Our course Website is maintained on the campus-wide online learning system Canvas, which can be accessed through “https://canvas.okstate.edu”.

Since the information in our class pages will be constantly updated, please check in Canvas regularly (Announcements, Assignments, Modules, etc.).

General notes:

1. All class materials (announcements, lecture notes, assignments, etc.) will be disseminated on Canvas.

6. Homework and Examinations

There will be about six homework assignments, one test, and one final examination.

7. Course Grade

The course grade is based on the homework (40%), test (25%), and final examination (35%). The passing letter-grade is determined by the following partition of the course grades:

   D : [50, 60); C : [60, 70); B : [70, 85); and A : [85, 100]

8. Miscellaneous

1. Lectures: Lectures are not mandatory, but historically, students with active attendance/coursework have done significantly better on examinations than their less frequently attending classmates.
2. **Homework**: Problem sets form an important part of the learning in the course, and thus, you are required to do them in order to pass.

3. **Collaboration and Sharing**: You are encouraged to discuss approaches with other students on solutions of assigned coursework, but you must write up solutions on your own **independently** and acknowledge your source in the write-up for each problem. If you obtain a solution with help (e.g., through library or publicly available work, or academic work by other students — whether in this or previous semesters), acknowledge your source, and write up the solution on your own.

   **Notes**: Read relevant documents/guidelines about academic integrity at Oklahoma State University in Academic Integrity Resources at the following URL:
   https://academicaffairs.okstate.edu/academic-integrity/index.html

9. **Student Disability Services**
Student Disability Services and other Student Services are committed to providing support services to students with physical and learning disabilities. Please advise the instructor of desired academic accommodations, and notify Student Disability Services.

10. **Academic Dishonesty or Misconduct**
Refer to the section in “University Academic Regulations” in current “University Catalog” (http://registrar.okstate.edu/)

11. **Adding/Dropping/Withdrawing, Important Dates, and Syllabus Attachment**
Refer to the section in “University Academic Regulations” in current “University Catalog” (http://registrar.okstate.edu/)

11. **Adding/Dropping/Withdrawing, Important Dates, and Syllabus Attachment**

1. **Test and Final Examination**: Tentative date for the test is October 4 (Monday), 2021.
   Adopting “Fall 2021 Final Exam Schedule”, the firm time/date for final examination is 10:00 – 11:50 am, December 10 (Friday), 2021 in regular class meeting place.
   Refer to the section in “Fall 2021 Final Exams”:
   https://registrar.okstate.edu/class_schedule_short_courses/exams.html

2. **Adding/Dropping/Withdrawing and Important Dates**: Refer to the section in “Academic Calendar”:
http://registrar.okstate.edu/

3. **Syllabus Attachment**: Refer to:
https://academicaffairs.okstate.edu/student-support/index.html
1. Mathematical Preliminaries
   Source: Lecture Notes, and [Ros19] Chapters 1 and 2
   1.1. Propositional Logic
   1.2. First-Order (Predicate) Logic
   1.3. Mathematical Proofs
   1.4. Sets and Set-Theoretic Operations
   1.5. Functions

2. Mathematical Induction
   Source: Lecture Notes, and [Ros19] Chapters 2 and 5
   2.1. Sequences and Summations
   2.2. Formulation of Induction, and Examples
   2.3. Weak/Strong Inductions and Other Variants
   2.4. Inductive Definitions, and Structural Induction

3. Fundamental Counting Methods
   Source: Lecture Notes, and [Ros19] Chapters 6 and 8
   3.1. Permutations and Combinations
   3.2. Combinatorial Identities and Combinatorial Arguments, and the Binomial Theorem
   3.3. The Inclusion-Exclusion Principle
   3.4. The Pigeonhole Principle

4. Introductory Probability
   Source: Lecture Notes, and [Ros19] Chapter 7

5. Relations
   Source: Lecture Notes, and [Ros19] Chapter 9
   5.1. Relations and Their Properties
   5.2. Closures of Relations
   5.3. Equivalence Relations