CS 600
Concrete Mathematics
Fall 2020

Instructor

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Online Office Hours: W 6PM to 6:50PM or by appointments
 Class   WEB Aug. 18, 2020 – Dec 11, 2020 Online Asynchronous

Course Introduction

Catalog Description: An introduction to discrete mathematics for
computer science graduate students. The course will cover topics: 1.
Logic and sets, 2. Relations and functions, 3. Induction and recursion,
4. Basic Counting and Combinatorics, 5. Discrete Probability, 6. graph
theory, 7. Complexity of Algorithms.

The purpose of the course: This course will prepare learners for
further study in discrete mathematics as well as any other discipline that requires discrete
mathematics. Students gain the skills needed to model problems abstractly, analyze solutions

Prerequisites

Prerequisites: Admitted to the graduate program.

Learning Objectives

By the end of this course, you will be able to:

- Demonstrate knowledge of the syllabus material;
- Write precise and accurate mathematical definitions of objects in discrete mathematics;
- Use mathematical definitions to identify and construct examples and to distinguish examples
  from non-examples;
- Validate and critically assess a mathematical proof;
- Use a combination of theoretical knowledge and independent mathematical thinking in
  creative investigation of questions and applications in discrete mathematics;
- Reason from definitions to construct mathematical proofs;

- Write about discrete mathematics and applications in a coherent and technically accurate manner.

Textbooks

Required Text: Free online lecture notes and materials will be available via Blackboard.

Recommended text: Most information required for the course is available online. Sources that can be used for the course include the following.

Discrete Mathematics and its Applications, 7th edition, by Kenneth Rosen, ISBN 0073383090

Essentials of Discrete Mathematics, 3/e, David J. Hunter. Published in 2017 by Jones & Bartlett Learning, LLC, an Ascend Learning Company. ISBN 978-1-284-05624-2

Discrete Mathematics lecture notes by L. Lovász and K. Vesztergombi, available at
https://www.cims.nyu.edu/~regev/teaching/discrete_math_fall_2005/dmbook.pdf

Graph Theory with Applications: John Adrian Bondy, U.S.R. Murty, Publisher: Elsevier Science Ltd/North-Holland, available for free download at
www.zib.de/groetschel/teaching/WS1314/BondyMurtyGTWA.pdf

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Technology Requirements

For this online course, you will need access to a reliable computer with high-speed internet access. To access the course, please log into http://blackboard.indstate.edu using your Sycamore ID and password. Do not access Blackboard through the MyISU Portal; if you do, your access may get timed out, and you will likely lose some of your work! You are expected to log in to Blackboard at least three times a week, and you must check your Sycamore email daily at http://webmail.indstate.edu in order to keep up with class updates.

Your computer should meet the following MINIMUM requirements:
- 2.0 GHz Processor or higher
- 4 GB Memory
- 120 GB Hard Drive or higher
- Wireless Connectivity (802.11 b/g minimum)
- Updated Windows or Mac Operating System
    - Windows
        - Windows XP SP2 or higher
        - Update: Start > All Programs > Windows Update
    - Mac
        - Update: Apple > Software Update

You must also have access to the following software and hardware:

- Antivirus Software (free download at http://downloads.indstate.edu)
- Firefox (free download at http://www.mozilla.org/en-US/firefox/new/) – Blackboard generally prefers this browser.
- Internet Explorer (free download at http://windows.microsoft.com/IE) – This is a backup browser for Blackboard. If you cannot access something in Firefox, try IE (or another browser) before contacting your professor or Indiana State's OIT Help Desk.
- Java (free download at http://www.java.com/getjava)
- Adobe Flash Player (free download at http://get.adobe.com/flashplayer/)
- Microsoft Office (free download at http://downloads.indstate.edu)
- Noise-cancelling headphones/microphone (external, not one built into your computer)

Course Policies

1. My goal is for you to excel in this class and to develop the skills necessary to succeed in your chosen career. However, **you have the major responsibility for doing well**. Achievement of course standards requires *you* to know what you need to do to improve your performance. You are expected to carefully read assignments and the feedback returned to you, to note evaluation comments made to the entire class regarding assignments returned. *You cannot meet the objectives of this course by being a passive learner*. As the semester progresses, you should be able to implement several ideas to improve your performance. Also, you are expected to ask questions and or/schedule individual appointments to clarify evaluations or other aspects of the course not clear to you.

2. **Time-management** is crucial in this course. Typical 3-credit-hour courses meet 2.5 hours every week, and you are expected to spend 2-3 times that on activities outside the classroom. Therefore, in general you should spend a total of 7.5-10 hours per week.

3. Turn in all work on time. Work turned in after the posted due date and time is considered late. **Late work on assignments will be penalized 20% for each day late.** Late work on quizzes and exams will not be accepted unless you are experiencing extraordinary situation and notify instructor immediately.

4. **Be courteous and respectful** to your classmates and to me. Please refer to the *ISU Code of Student Conduct*.
   a. Maintain a formal, respectful, civil, professional tone with *all* course communications, including but not limited to blog posts, discussion boards, and emails. Avoid derogatory language, obscenity, and hate speech.

Grades

The following scale will be used to determine your course grade:

A+	97-100%	C	73-76%
A	93-96%	C-	70-72%
A-	90-92%		
B+	87-89%		
B	83-86%		
B-	80-82%	F	69% or below
C+	77-79%		

Assessment and Feedback

Assessment: a combination to be decided of written assignments, presentations, and participation in office hours.
The work you do this semester will be weighted as follows:

Homework   40%
Written Tests   50%
Presentation/Project   10%

You can expect to receive grades (and any necessary, corresponding feedback) on each task within one week of the due date. You can also set up your Blackboard notifications so that you are emailed each time I have updated a grade.

Total Points: 400pts = HW 160pts +Presentation 40pts + Midterm Test 100pts + Final Exam 100pts

Conferences and Individual Help

I will be available via Office Hour as scheduled in Blackboard Meeting Room and/or individual appointments. You are also strongly encouraged to **take advantage of ISU's Math & Writing Center.** The Math & Writing Center offers face-to-face and online one-on-one mathematics tutoring assistance for all Indiana State students. Current hours of operation and additional services can be found at their website: http://libguides.indstate.edu/writing.

Communication Policy

You are required to work at least 7 hours each week and finish your weekly readings/lecture videos, homework, tests on time. Login to computer at least 3 times a week and come to office hour on Wednesday if possible.

Please understand that I am not on-call 24/7. You can expect responses to your inquiries based on the following guidelines:

➢ You should **check your ISU email daily** to stay current and avoid missing any important announcements or other correspondence. Missing important communications may jeopardize your success in the course.

➢ Before emailing me a question or calling, please **consult the Syllabus, Blackboard site, textbook, and other available resources.** You will find many answers among the sources provided.

➢ Emails to me will be **answered within 48 business hours**; do not expect me to respond to your emails during the weekend or on holidays. Please be patient. I *will* respond to your inquiries.

➢ Emails must be sent **using your ISU email account** (associated with Blackboard). Emails that are sent using non-ISU accounts are automatically funneled by the email program into the junk folder, which is I rarely check.

➢ **Emails must contain at least the following information: CS600.301** and the subject of your message in the subject line of the email (e.g. Question about Homework Assignment). Emails that do not contain the above identifying information may be deemed spam/junk and may be inadvertently deleted.

➢ The *easiest* and most *efficient* way to get ahold of me is in class or email; however, if you choose to call, v**oicemails** to my office phone will be returned within two business days.

Technology Help

As a member of this learning community, you are expected to have basic computer skills, take responsibility for using appropriate hardware and software, and have a general understanding of how to use Blackboard, plug-ins, etc. Technical problems will not serve as a valid excuse for a missed or late assignment.
Please inform me as soon as you know there is an issue. I may be able to assist you, otherwise, the Office of Information Technology (OIT) offers many resources to assist with your technology needs. First, you can use a self-help tool available through the MyISU Portal as well as on the OIT website. Here you have direct access to the OIT **Knowledge Base** with up-to-date information about common errors, problems, and issues within Blackboard and other supported technologies. Think of this as an FAQ resource. Simply log into the MyISU Portal and click on the **Help Desk Self-Service** badge available in the Workspace tab to browse the categories.

You can also submit a help desk ticket through the OIT website or via the **Submit a Ticket** link within the **Help Desk Self-Service** in the Workspace tab in the MyISU Portal. By defining in detail your problem with the drop-down selections available, your ticket will be routed directly to the group or individual who can best assist you. As you are typing your ticket, Knowledge Base articles may be presented to you that may help you resolve your issue without having to create a ticket in the first place.

If you are wondering about the status of a ticket that you currently have open with OIT, you can click on the **My Tickets** link within the **Help Desk Self-Service** in the Workspace tab in the MyISU Portal to view your history. You can use this mechanism to track progress or to add information to the ticket yourself.

If you have a specific Blackboard concern, please contact **Instructional Tools**:
Phone: 812-237-7000
Email: isu-blackboard-support@mail.indstate.edu

Or contact the **OIT Help Desk** directly for general technology help:
Phone: 812-237-2910 or 888-818-5465
Email: IT-Help@indstate.edu

Academic Honesty

It is imperative that you adhere to standard practices of academic honesty and integrity in this course. I encourage you to review the University's Academic Dishonesty Policy found in the Student Code of Conduct (see http://www.indstate.edu/sjp/docs/code.pdf). If I find that you have violated any part of the Academic Dishonesty Policy, at minimum, you will receive an F on the assignment, and possibly in the course.

Academic dishonesty is not tolerated at Indiana State. The penalties can be severe and include: failing the assignment, failing the course, and referral to Student Judicial Programs to face form conduct charges. Students found in violation may be suspended or expelled and can have a permanent notation affixed to the official transcript indicating that an academic integrity violation occurred.

Academic Freedom

Indiana State follows the American Association of University Professors' guidelines for academic freedom as described on their website (http://www.aaup.org/aaup/pubres/policydocs/content/ 1940statement):

Teachers are entitled to freedom in the classroom in discussing their subject, but they should be careful not to introduce into their teaching controversial matter which has no relation to their subject.

Accessibility

Indiana State University seeks to provide effective services and accommodation for qualified individuals with documented disabilities. The technology tools utilized within this course offer a variety of accessibility features, such as compatibility with screen readers, text-based visual alternatives, video scripts, and attention to Universal Design. The central platform for this course, Blackboard, also complies with ADA requirements. If you need additional accommodations because of a documented disability, you are required to register with Disability Support Services at the beginning of the semester. Contact the Director of Student Support Services at 812-237-2301. Once registered, the Director and course instructor will ensure that you receive all the additional help that Indiana State University offers.

Emergency Services

Unfortunately a catastrophic event could occur on a local, regional, or national level that disables communication to or from Indiana State University. Students should provide for their own safety and the safety of their family and then contact their instructors by phone, private e-mail, or through alternately provided numbers. Every effort on the faculty's part will be made to reasonably attempt to continue with the course and to meet the course objectives. If, for any reason, there is no internet or telephone communication available for an extended period of time, postal service will be used to continue; and in this instance students will be awarded incomplete grades until revised completion plans can be determined. The Department of Public Safety website can be accessed for the emergency response plan and other documents concerning student and faculty safety.

Statement on Non-Discrimination, Harassment, and Sexual Misconduct

Indiana State University is committed to inclusive excellence. To further this goal, the university does not tolerate discrimination in its programs or activities on the basis of: race, color, national origin, gender, age, sexual orientation, gender identity or expression, disability, veteran status, or any other protected class. Title IX of the Educational Amendments of 1972 in particular prohibits discrimination based on sex in any educational institution that receives federal funding. This includes sexual violence, sexual misconduct, sexual harassment, dating violence, domestic violence, and stalking. If you witness or experience any form of the above discrimination, you are asked to report the incident immediately to Public Safety: 812-237-5555 or to The Office of Equal Opportunity & Title IX: 812-237-8954.

Sycamores Care

Sycamores Care about you! Sycamores Care is a campus-wide program that cares for students and helps students overcome obstacles. The Office of the Dean of Students collaborates with all Indiana State University departments to create a caring culture at Indiana State. Family members, fellow students, faculty, staff, and employers can make a referral to Sycamores Care. Anonymous referrals are accepted & students may refer themselves too. You can make a referral through the **Sycamores**

Care Referral Form (https://www.indstate.edu/student-affairs/sycamores-care), emailing ISU-DeanOfStudents@mail.indstate.edu, or by calling **812-237-3829.**

Disclaimer

In order to meet your and other student and course needs, I reserve the right to make changes to the syllabus, schedule, course content, assignments, and course delivery techniques.