CS 1200 Discrete Mathematics for Computer Science Syllabus

Instructor: Peizhen Zhu
Computer Science Department
Missouri University of Science & Technology

Fall 2018

1 Course Description

COMP SCI 1200 Discrete Mathematics For Computer Science (LEC 3.0)
A rigorous treatment of topics from discrete mathematics which are essential to computer science. Principal topics include: formal logic (propositional & predicate), proof techniques, mathematical induction, program correctness, sets, combinatorics, probability, relations, functions, matrices, graph theory and graph algorithms.

2 Goals for the Course

After the successful completion of this course, the student should be able to do the following.

1. Understand the important basic concepts of computer science and have an improved ability to solve problems with the computer.
2. To be able to think more clearly and abstractly.
3. To understand formal logic and the axiomatic method.
4. To be able to map theoretical ideas into Python programs.
5. To have a basic working knowledge of formal logic (propositional & predicate), proof techniques, mathematical induction, program correctness, sets, combinatorics, probability, relations, functions, matrices, graph theory and graph algorithms.

Numerical Range	Letter Grade
85 or above	A
75-84	B
65-74	C
55-64	D
54 or below	F

Table 1: Numerical Scores Converted to Letter Grades

3 Prerequisites

A "C" or better grade in Comp Sci 1570.

4 Grading

There will be 3 grades in this course. The first grade will be worth 10% of your final grade and will be provided by your responses to questions and quizzes that will be administered in class and to which you will respond with clickers.

There will also be a homework grade which will be the average of your homework grades. Your homework must be your original work. We will use programs to look for similarities in submissions. If we find them, expect that there will be serious consequences. Giving your original work to others is considered cheating and you will be receive the same punishment as people who copy your work whether you gave them "permission" to copy your work or not. Your homework grade will provide 30% of the final grade.

In-class exams will provide 60% of the grade. There will be 3 prelims and a final. Each prelim will provide 12% of the grade and the final will provide 24% of the grade.

1. The grades will be assigned as shown in Table 1.
2. To reward improvement, if you do better on a later exam, the better grade will replace all lower grades that came before it. If you do worse on subsequent exams, you get to keep the grade you originally got. Thus, improvement is rewarded. For example, if you got 50% on prelim 1, 90% on prelim 2, 75% on prelim 3, and 80 % on the final, your final grade will be calculated using 90% for prelim 1, 90% for prelim 2, 80% for prelim 3, and 80% for the final. This means that a poor exam score will not hurt you if you improve.
3. The exam average is computed as follows, where p1, p2, p3 are the three prelim scores and f is the final score.

   Eavg = .12*max(p1,p2,p3,f) + .12*max(p2,p3,f) + .12*max(p3,f) +.24*f

The final average is computed by

$$\text{favg} = \text{eAvg} + .3*\text{hwAvg} + .1*\text{clickerAvg}$$

4. All numbers are rounded and the letter grades are assigned according the scale shown in Table 1.

5. It is important that you do and understand the homework, since the exams will be based on the homework problems.

5 Additional Notes

1. Tentative dates for the exams are listed in the schedule below. These times might move around as necessary.

2. All exams are closed book and in class or in a testing facility.

3. All exams are cumulative and cover all the material up to the time that they are given.

4. Partial credit will be given on exam problems.

5. We want people to work on the homework individually. You can talk to each other and give help, but this help should not take the form of letting other people copy your work. It is important that you understand how to do all the problems on your own so you can do well on the exams. If you need help, please ask questions in class, on Canvas, and come during office hours.

6. If a problem asks you to write a program, a function or a procedure, always submit a listing and output, even if the problem does not explicitly ask for these. The "official" programming language of the course will be Python, which means that all submitted programs must be in Python. If you don't know Python, this is a good opportunity for you to learn it. It is very easy to learn. We will provide some reference material for Python. Also, the programs that we will present in class will provide an introduction to Python. You will discover that it looks a lot like pseudo-code.

7. All homework submissions will be electronic via Canvas. More details will be provided with every assignment.

8. Many materials will be available via Canvas using your MST credentials. You will automatically be enrolled in the appropriate area of Canvas once your registration in the course is complete.

9. If your programs have bugs, we expect you to make a reasonable effort to find the bug on your own. We will be happy to help you find problems in your programs, but you must come with evidence that you have tried to find the problem on your own and the program we see should have evidence of your efforts to debug it.

10. If you run out of time and must turn in a program that doesn't run, submit output showing the crash and the error message along with the program.

11. Be sure that your code includes comments that explain what you are doing if it is not completely obvious. It is up to you to explain what you are doing. You will appreciate this point better once you have experience reading other people's code.

12. If you do not understand a problem get a clarification from me. Do not waste a lot of time working on something that you don't understand. You should not expect to use the fact that you did not understand a problem as an excuse for doing poor work. You should make sure that you understand each problem before you attempt to do it.

13. Homework submitted late with will lose points. Please turn in your work on time. If special circumstances will cause you to be late with your homework, please contact me as soon as you can about this.

14. We expect very high-quality submissions from you. Points will be deducted for sloppy or disorganized work.

15. Any program that you submit must include sample output that adequately tests it. This sample run should not be copied from the screen by hand – it should be either output generated by the program and collected by you or a screen dump if that captures the results better. Be sure to include the output/screen dump at a reasonable place in your document. You should think carefully about what constitutes an adequate test for each program that you write. You will lose points for inadequate testing.

16. When you write programs, pay attention to the human interface. The requests for data should be reasonable. Ridiculous interfaces will lose points just for being ridiculous.

17. All submissions must be typed – no handwritten submissions will be accepted.

18. Be sure to answer the question. If you are asked for an analysis of an algorithm, be sure to supply one. Do not assume that you will receive the bulk of the points simply for coding it. Also, if we ask you to analyze an algorithm, analyze the one you are given. Don't analyze some other algorithm. Don't answer questions that are "almost" like the questions you are asked.

19. We expect your algorithms to be reasonably efficient. Just simply whipping something together that gets the job done might not be enough. Also, if you make modifications to algorithms, you will lose points if you make the algorithm perform significantly less efficiently than what was presented.

20. Put some thought into organizing your submissions.

21. Submit all necessary pieces. We don't want to guess what data types you used, etc. You will lose points for submitting poorly organized and unreadable material

22. You will lose points for poor programming style. We do not want to see hoards of global variables in your programs. You have been taught how to do things correctly and we want to see you do it.

23. We are only interested in grading your original work. We are not interested in grading solutions to the problems that have been posted by other professors on the Web. You can lose many points if you simply copy solutions from other people or other sources.

24. If you have problems with this course and need help see me or the graduate assistant as soon as possible. Don't procrastinate until the end of the semester when it is too late to help you.

6 Contact Information

Information for instructor: Peizhen Zhu

Name	Peizhen Zhu
Office	CS 320
Office Hours	3PM-4:30PM Mon & 1:30PM-3:00PM Thu
Phone	(573) 341-6185
Email	zhupe@mst.edu

7 Textbook

We will be using *Discrete Python* written by Dr. George Markowsky as the principal text. This text will be available on Canvas. On Canvas you will also find several books about Python. There is no charge for any of the materials.

8 Meeting time and location:

MoWeFr 2:00PM - 2:50PM at HSS G5

9 Supplementary Syllabus Materials for 2018

The material in this section is based on material from

Jeff Cawlfield, Vice Provost
Office of Academic Support 105 Norwood Hall
320 West 12th Street
Rolla, MO 65409-1520
Phone: 573-341-7276
Email: ugs@mst.edu
Web: `http://ugs.mst.edu`

9.1 Title IX

Missouri University of Science and Technology is committed to the safety and well-being of all members of its community. US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Furthermore, in accordance with Title IX guidelines from the US Office of Civil Rights, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Title IX Coordinator, any notice of sexual harassment, abuse, and/or violence (including personal relational abuse, relational/domestic violence, and stalking) disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises.

Missouri S&T's Title IX Coordinator is interim chief diversity officer Neil Outar. Contact information for reporting Title IX violations.

Email: naoutar@mst.edu
Phone: (573) 341-6038
Temporary Facility A-1200 N. Pine Street

To learn more about Title IX resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit `http://titleix.mst.edu`.

9.2 Student Honor Code and Academic Integrity

Academic integrity is very important in ALL S&T classes. Academic integrity matters to you, it matters to the discipline of Computer Science and it matters to future employers. You must pay attention to the Honor Code developed and endorsed by the Missouri S&T Student Council: the Honor Code can be found at `http://stuco.mst.edu/honor-code`.

Encourage students to read and reflect upon the Honor code and its emphasis on HONESTY and RESPECT. Page 30 of the Student Academic Regulations handbook describes the student standard of conduct relative to the University of Missouri System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage `http://registrar.mst.edu/academicregs/index.html`. Additional guidance for faculty, including the University's Academic Dishonesty Pro-

cedures, is available on-line at http://academicsupport.mst.edu. Other informational resources for students regarding ethics and integrity can be found online at http://academicsupport.mst.edu/academicintegrity/studentresources-ai.

9.3 S&Tconnect

S&TConnect can be found at https://canvas.mst.edu/. The S&Tconnect icon is on the left toolbar. S&Tconnect provides an enhanced system that allows students to request appointments with their instructors and advisors via the S&Tconnect calendar, which syncs with the faculty or staff member's Outlook Exchange calendar. S&Tconnect will also facilitate better communication overall to help build student academic success and increase student retention. S&Tconnect Early Alert has replaced the Academic Alert system used by Missouri S&T. If training is needed, please contact Rachel Morris at rachelm@mst.edu or 341-7600. If you want to reach George Markowsky, please go through the CS Department staff in 325 CS Building.

9.4 Classroom Egress Maps

Students should familiarize themselves with the classroom egress maps posted on-line at http://designconstruction.mst.edu/floorplan.

9.5 Accessibility and Accommodations

It is the university's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please contact Disability Support Services at (573) 3416655, dss@mst.edu, or visit http://dss.mst.edu for information, or go to https://mineraccess.mst.edu to initiate the accommodation process.

Please be aware that any accessible tables and chairs in this room should remain available for students who find that standard classroom seating is not usable.

9.6 LEAD Learning Assistance

The Learning Enhancement Across Disciplines Program (LEAD) sponsors free learning assistance in a wide range of courses for students who wish to increase their understanding, improve their skills, and validate their mastery of concepts and content in order to achieve their full potential. LEAD assistance starts no later than the third week of classes. Check out the online schedule at http://lead.mst.edu/assist, using zoom buttons to enlarge the view. Look to see what courses you are taking have collaborative LEAD learning centers (bottom half of schedule) and/or Individualized LEAD tutoring (top half of the schedule). For more information, contact the LEAD office at 341-7276 or email lead@mst.edu or visit http://lead.mst.edu.

9.7 The Burns & McDonnell Student Success Center

The Student Success Center is a centralized location designed for students to visit and feel comfortable about utilizing the campus resources available. The Student Success Center was developed as a campus wide initiative to foster a sense of responsibility and self-directedness to all S&T students by providing peer mentors, caring staff, and approachable faculty and administrators who are student centered and supportive of student success. Visit the B&MSSC at 198 Toomey Hall; 573-341-7596; success@mst.edu; facebook: `www.facebook.com/SandTssc` ; web: `http://studentsuccess.mst.edu/`.

If you have any questions about the information listed above, please contact the Office of Academic Support at 573-341-7276.