

Math 454: Online Course Structure

Current Summary:

- Lectures for each week will be split into short (20-30) minute videos and uploaded to Youtube, and the link to the weekly playlist will be provided through the course webpage under “Class Log”. I expect that you finish viewing at least one video (preferably more) by the Monday’s class meeting and all the videos by Wednesday’s class meeting. See more details in item 3 below.
- During our former lecture times, Monday and Wednesday at 11:25am-12:40pm, we will hold an open discussion through Blackboard Collaborate Ultra (you can find a link for each session from the Blackboard page for this course). I expect everybody to attend these lecture meetings. If you are unable to do so for any reason, please let me know by email. Sessions will be recorded and recordings can be found on BB CU. See more details in item 4 below.
- HW will continue to be assigned every week as usual and will be due on Thursday at 11:59pm, with a grace period of 12 hours (so you can submit the HW by Friday 11:59am without penalty or asking me). For submission, email a single PDF file of your typed or scanned solutions to the course TA (Gunjan Sharma: gsharma7@hawk.iit.edu), and the email subject line should say ”Math 454: HW#8” as appropriate. See more details in items 5 and 5a below.
- TA office hours (Gunjan Sharma on Monday: 9-10am and 12:45-1:45pm, on Wednesday: 1:45-2:45pm) will be held using Blackboard Collaborate Ultra linked through <https://sites.google.com/iit.edu/virtual-math-learning-center/home>
- My Office Hours (in addition to questions asked through Piazza forums, email, and lecture discussion sessions) will be held on Monday and Tuesday at 4:45pm through the Course Blackboard Collaborate Ultra. See more details in items 6, 6a, and 6b below.
- Mid-term Exam 2 will be held on Wednesday April 15th, as announced. I will share the exam questions with you at 5pm on 4/15 through your email. Your exam solutions will be due to me by email (in a single PDF file) by 1am on 4/16, eight hours later. You are allowed to refer to your textbook, lecture notes, and HW solutions, but nothing and nobody else. Final Exam will be held during the official 2-hour time period announced by the university, also listed on the course webpage. See more details in item 7 below.
- As per the university instructions, all semester grades for 400-level courses will now be Pass/Fail. See more details in item 8 below.
- Join me and your classmates for a “tea-time” meeting on Google Meet every Friday at 4pm. I will send an invite each Friday morning by email. See more details in item 10 below.
- Important websites:
 1. Course Webpage: www.math.iit.edu/~kaul/TeachingSpr20/Math454.html
 2. Course Blackboard Page: blackboard.iit.edu/ultra/courses/_104406_1/cl/outline
 3. Piazza Forums: piazza.com/iit/spring2020/math454/home

Instruction in the time of Coronavirus:

This Document will be updated as more information becomes available.

(Original: 3/13/2020. Revised: 3/20/2020, 3/22/2020, 3/23/2020, 3/31/2020.)

As we all know, in-person instruction is suspended at the university till further notice. This means we will have to make changes to the way we learn and conduct classes in this course. However, I want to emphasize that our goals and aim for your learning and education have not changed. As I say in the documents ‘Course Information Handout’ and ‘My Aim for this Course’:

This course will introduce students to modern graph theory (as a versatile mathematical language for modeling real-world phenomenon) through foundational concepts and fundamental existential and algorithmic problems related to trees, matchings, connectivity, planarity, and coloring, using proof techniques based on induction, extremal choices, and algorithms.

And we are only part of the way through doing this and have much more to learn.

I have a number of important announcements below. Please make a note of them.

1. **The most important thing to remember is that I am here to help with any difficulties you might face in or with this course.** This is even more important to remember since we may not see each other in person. In addition to any difficulties with learning, if you are facing any difficulty with logistics or access related to course work, please get in touch with me so we can together figure a way out of that issue.
If any of your circumstances change, please let me know. Have you moved since the spring break? How is the internet connection where you are? Are you facing any technical difficulties connecting or accessing course materials, etc.? Is there anything else I need to know as your instructor regarding your situation right now or in the coming weeks? Please write and let me know. If you prefer talking over the phone or Skype or Hangouts or any such messaging app, please let me know.
2. **Please re-read the two main course documents (‘Course Information Handout’ and ‘My Aim for this Course’) on the course webpage.** And review this document as well (which will also be accessible from the course webpage).
3. I am not sure yet how I will make my lectures. I will work on this over the spring break and inform you as I as soon as I know more. I might use screen-capture apps to create my own videos or be videotaped in an empty classroom (if IIT can provide the resources to do so).

I want to take this opportunity to thank all of you for being such enthusiastic participants in our classroom lectures. Whether or not you spoke out loud, I truly appreciated the energy your presence and your interest gave to our classroom. I will miss that. You won’t believe how many of my friends and family I have told about this class and how teaching it gives me energy!

[Revision 3/20, 3/22, 3/23]:

Lectures for each week will be split into short (20-30) minute videos and uploaded to Youtube. You will be given access to each week’s videos through a Youtube playlist for that week. I have already given you (or rather your iit account, so make sure you are logged into

youtube using your iit account through my.iit.edu) the permission to view these videos. View them at your leisure (the subtitles work reasonably well too). I expect that you finish viewing at least one video by the Monday's class meeting and all the videos by Wednesday's class meeting.

Additional Comments:

I decided to upload pre-recorded lectures to Youtube because Youtube is a robust website that works even with not-so-great internet connections. Also I have limited myself to around 140 total minutes of video each week, split into 4-5 shorter videos.

Advice given by colleagues from other universities who are more experienced in online teaching warned that Blackboard is not very dependable especially when internet connection is not very strong. That is why I went with asynchronous videos on youtube.

So, how should you use these videos? Think of them like in class-lectures that you can pause anytime you like, anytime you are interrupted, or anytime you need a break. Its important that you keep your notebook and textbook open next to you. Take notes and note down any topics or points that you are unclear on. Please don't fall into the trap that 'I will simply watch the video again later'. Of course, you can do that but don't postpone making some basic notes the very first time you watch a video. Make sure you have watched enough so that you are ready to join the discussion during class time on Monday and Wednesday, as noted next.

4. **[Revision 3/20, 3/22, 3/23]:**

During our former lecture times, Monday and Wednesday at 11:25am-12:40pm, we will hold an open discussion through Blackboard Collaborate Ultra. I expect everybody to attend these lecture meetings. If you are unable to do so for any reason, please let me know by email. Sessions will be recorded and recordings can be found on BB CU.

You can find a link for each session from the Blackboard page for this course, I have already created each session which will open at the appropriate times each Monday and Wednesday at: https://blackboard.iit.edu/webapps/collab-ultra/tool/collabultra?course_id=_104406_1&mode=cpview These sessions will give you an opportunity to ask questions about anything from the video lectures of that week. As you watch the lecture videos on Youtube, note down any topics or steps that you need help with understanding. I expect that you finish viewing at least one video by the Monday's class meeting and all the videos by Wednesday's class meeting. Here is an overview of how to use Collaborate Ultra: <https://www.youtube.com/watch?v=1W4sGpVmJaY>

5. **HW will continue to be assigned every week as usual.** HW#8 was uploaded on the course webpage on Wednesday as usual, and is due on Wednesday, 3/25, after spring break. HW#9 will be assigned on 3/25 and will be due a week after that. And so on.

[Revision 3/23]:

Based on the feedback from many of you, I am making the following change to the due date for the HW each week, starting with HW#8. **HW will be due on Thursday at 11:59pm,** with a grace period of 12 hours (so you can submit the HW by Friday 11:59am without penalty or asking me).

5a. Starting with HW#8, your submission must be done through email. **Email a single PDF file of your typed or scanned solutions to the course TA** (Gunjan Sharma: gsharma7@hawk.iit.edu), and the email subject line should say "Math 454: HW#8" as appropriate.

6. I have to figure out how to hold **virtual office hours** as needed. I will update you as soon as I learn more about holding discussions/office hours through Blackboard. However, as usual **I will be available for consultation through email and through Piazza. I request and**

strongly encourage you to ask questions through Piazza forums as that will give everyone a chance to join in and learn together: piazza.com/iit/spring2020/math454/home

6a. **[Revision 3/20]:**

TA office hours (Gunjan Sharma on Monday: 9-10am and 12:45-1:45pm, on Wednesday: 1:45-2:45pm) will be held using Blackboard Collaborate Ultra linked through <https://sites.google.com/iit.edu/virtual-math-learning-center/home> (NOT through the Course Blackboard). You can find good instructions for how to use these tutoring sessions at <https://www.youtube.com/watch?v=ov4WzBCFA1w>

6b. **[Revision 3/20]:**

My Office Hours (in addition to Piazza questions and lecture discussion sessions) will be held on Monday and Tuesday at 4:45pm through the Course Blackboard Collaborate Ultra. You can find a link for each session from the Blackboard page for this course, I have already created each session which will open at the appropriate times each Monday & Tuesday at:
blackboard.iit.edu/webapps/collab-ultra/tool/collabultra?course_id=_104406_1&mode=cpview

7. **Exams** are still scheduled as listed in the course webpage. How exactly we will hold them is something I will have to figure out over the next 3-4 weeks. I will keep you updated.

[Revision 3/23]:

I am leaning towards open-book, take-home exams. I will confirm and make a formal announcement closer to the date of the exams. I can consider changing the date of the exam to make it closer to the weekend if that's better for most of you. Email and let me know.

[Revision 3/31]:

Mid-term Exam 2 will be held on Wednesday April 15th, as announced (and syllabus as announced on the course webpage that corresponds to topics related to HWs#6,7,8,9,10). I will share the exam questions with you at 5pm on 4/15 through your email. Your exam solutions will be due to me by email (in a single PDF file) by 1am on 4/16, eight hours later. The exam will be a standard one meant to be completed in less than 80 minutes but you will have 8 hours to complete it, in order to allow for any variations in your personal schedules. You are allowed to refer to your textbook, lecture notes, and HW solutions, but nothing and nobody else.

Final Exam will be held during the official 2-hour time period announced by the university, also listed on the course webpage.

8. **[Revision 3/23]:**

As per the university instructions, **all semester grades for 400-level courses will now be Pass/Fail.** Only exceptions are Seniors and Graduate students, who may request a usual letter grade. Please talk to me if fall into one of these categories, or if you have any concerns about grades. I will still input the usual scores for HWs, Exam, etc. to calculate your semester score.

9. I didn't have a chance to say too much about the "**Spring Break Bonanza**" handout I gave out on Wednesday before the spring break. It has two interesting problems that I thought many of you will have fun thinking about. Second one is more of a curiosity but the first one is in fact an important algorithmic question. For example, in social networks, the presence of a complete graph indicates the presence of a close-knit community.

10. **[Revision 3/22]:**

How about a weekly tea-time? I plan to hold an open “tea=time” meeting on Google Meet (which you can access through IIT Google Suite or your IIT gmail account) **every Friday at 4pm**. I will send an invite each week by email or Google calendar.

It will just be an opportunity to say hello, see other faces, and chat a bit about non-course related topics. Its important to find a sense of community during these times. I hope we are able to support each other in whatever little way we can.

That is all for now. Please check your email regularly as that will now be our primary means of communication. And don't hesitate to write back if you have any follow-up questions or concerns.

Take care of yourselves and stay safe,
Hemanshu

P.S. Important websites:

1. Course Webpage: www.math.iit.edu/~kaul/TeachingSpr20/Math454.html
2. Course Blackboard Page: blackboard.iit.edu/ultra/courses/_104406_1/cl/outline
3. Piazza Forums: piazza.com/iit/spring2020/math454/home