

Summary of MATH 220 End-of-Term Survey Results April 2012

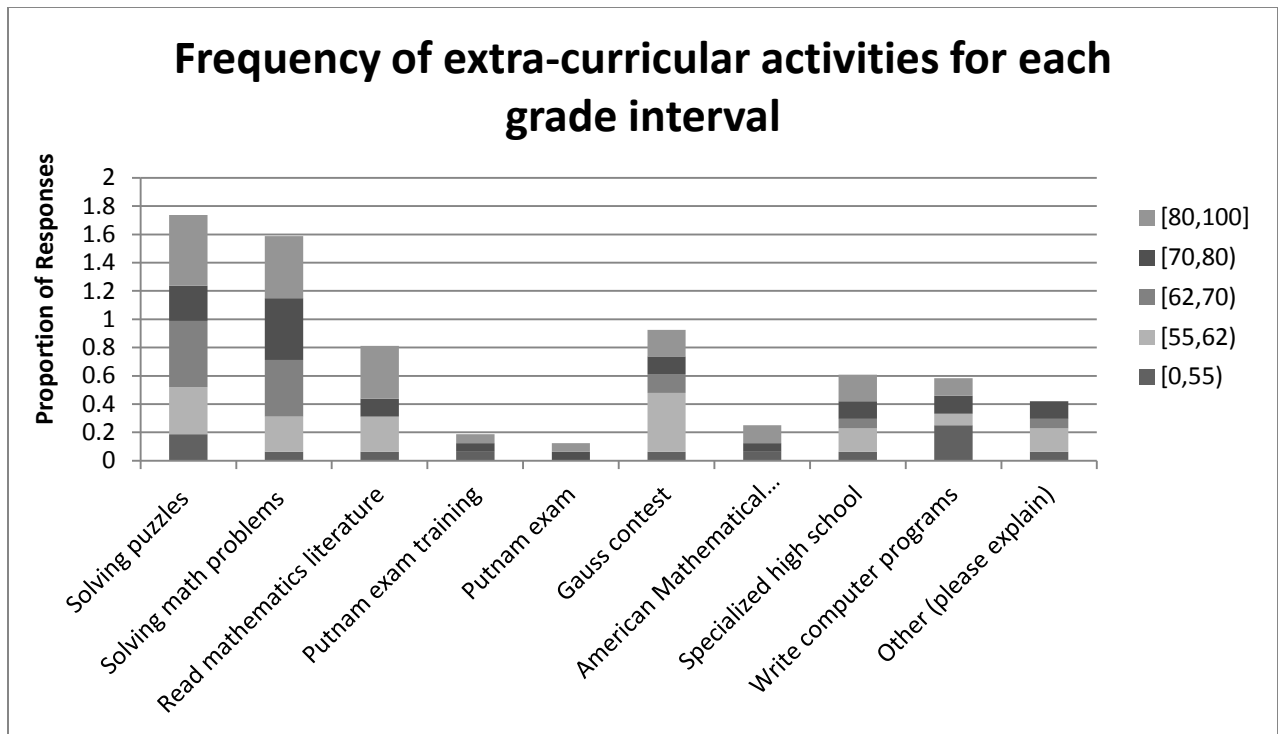
This report summarizes the results of the end-of-term survey administered in MATH 220 in April 2012. The survey was completed by 77 students, 43 in section 201, 34 in section 202. It was not anonymous, but the identity of student responses was kept confidential from the instructor. Open-ended questions are not summarized here. In cases where the same questions were answered on the 2010WT1 survey or the 2011WT2 midterm survey that data is reprinted here for comparison and some comments are included about differences.

Q1: What extra-curricular mathematical experience do you have? Please check all that apply.

Response	Number of Responses	Proportion of Responses (%)
I like solving puzzles in my spare time	26	34
I like solving math problems in my spare time	25	32
I read mathematics literature other than my course textbooks	13	17
I took part in the Putnam Exam training	4	5
I took the Putnam Exam	2	3
I took part in Gauss contest	13	17
I took part in the AMC (American Mathematical Competition)	4	5
I attended a high school that specialized in mathematics and science	10	13
I write computer programs as a hobby	10	13
Other (please explain): -PIMS UBC Math workshop -I like logic riddles -Archimedes club in high school (investigates mathematical curiosities) -I do math in my sleep	6	8

Comparison of Extra-curricular activities with MATH 220 grades:

For this and many other survey questions, students were grouped by grade in MATH 220. The grade intervals were chosen so as to distribute the number of students in each interval as evenly as possible. The intervals and numbers in each interval are: [80,100]: N=16, [70,80): N=16, [62,70): N=15, [55,62): N=14, [0,55): N=14. The following figure shows the proportion of students in each of these intervals that checked off each of these extra-curricular activities.



Comments: Descriptively, a larger proportion of the low grade range, [0,55), wrote computer programs as a hobby and a smaller proportion solved math problems or read math literature beyond their coursework.

Q2: Why were you taking this course?

Response	Number of Responses	Proportion of Responses (%)
It is required by my program	59	79
Other (please explain)	21	28
-As an elective (4 times)		
-For interest (5 times)		
-Fun/hobby (4 times)		
-For Math 320 or other higher-level proof-oriented courses (3 times)		
-Required for math minor		
-With friends		
-Friend recommended		
-To get to grad school		
-Want to take STAT 460/461		
-I felt it would be beneficial		

Comments: The majority of students took MATH 220 because it is required by their program. Of those that selected "Other," interest and fun were common reasons for taking the course.

Q4: On average, how much time per week did you spend doing the homework in Math 220? __ (hours)

Note: several students responded with a range of hours (ex. 6 to 8 hours). In these cases I chose the midpoint of the interval they reported for the calculation of the mean below.

	2010 WT1 (N=86 responses)	2011 WT2 (N=70 responses)
Mean	4.92	3.39
Standard Deviation (SE)	3.00 (0.32)	2.41 (0.29)

Comments: Students appear to spend significantly less time on homework in the 2011 WT2 term, with the new workshop format.

Q5: Typically, when did you start your Math 220 homework?

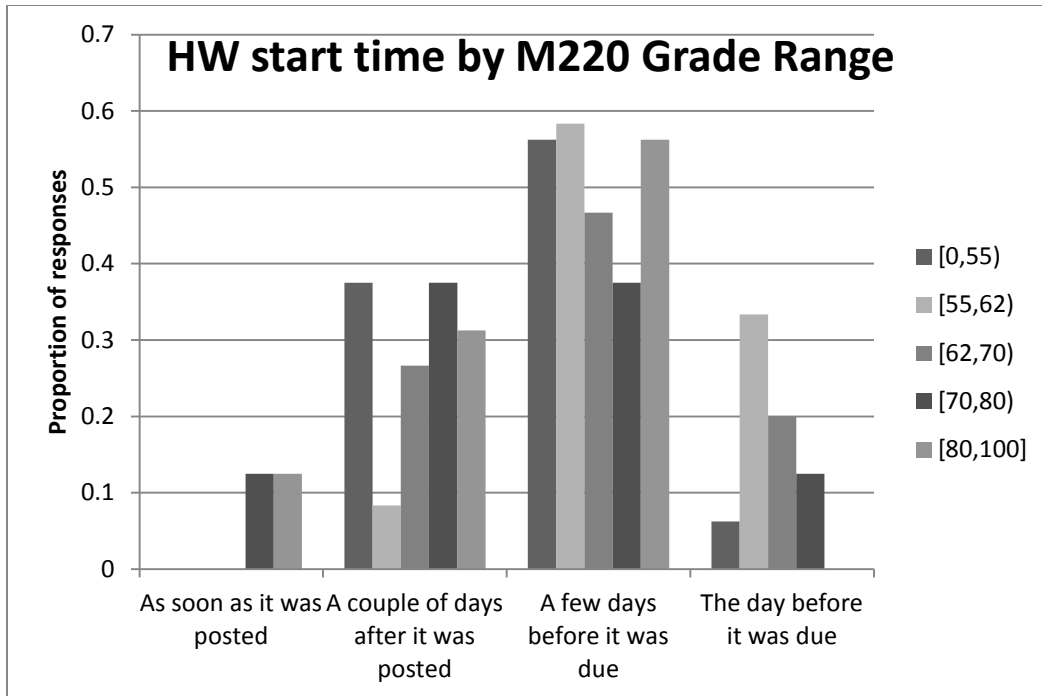
Note: students who checked more than one response were removed from the sample.

Response	2010 WT 1		2011 WT 2		2011 WT 2 MIDTERM	
	Number of Responses	Proportion of Responses (%)	Number of Responses	Proportion of Responses (%)	Number of Responses	Proportion of Responses (%)
As soon as it was posted	4	5	4	5	3	7
A couple of days after it was posted	22	29	24	30	10	24
A few days before it was due	40	53	36	44	21	50
The day before it was due	10	13	16	20	8	19
I never do assignments	0	0	1	1	0	0

Comments: There is no significant difference in the distribution of homework start times between the two years or between Midterm survey and End of Term survey responses. Most students start the homework a few days before it is due or a couple of days after it was posted.

Relationship between homework start time and grade in Math 220:

The following figure shows the proportion of responses in each grade interval (as for Q1).



Comments: Students with final grades in the [80,100] interval appear to have started their homework earlier than students in the other groups.

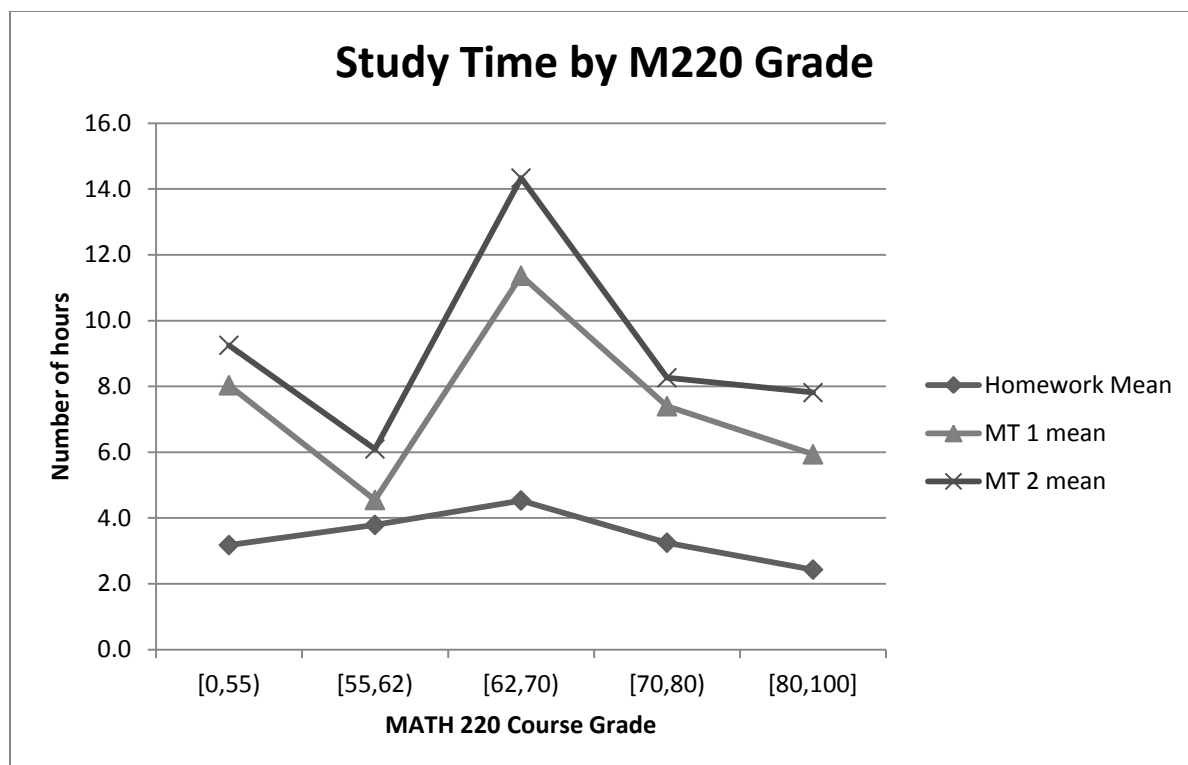
Q6: Approximately how much time did you spend studying for each of the midterm exams? (fill in the blank)

	2010 WT1 (N=80 responses)		2011 WT2 (N=72 responses)	
	Midterm 1	Midterm 2	Midterm 1	Midterm 2
Mean	8.60	10.40	7.49	9.19
Standard Deviation (SE)	6.58 (0.74)	7.74 (0.87)	6.39 (0.75)	9.24 (1.09)

Comments: Students report spending more time studying for midterm 2 than for midterm 1. There is no significant difference between terms in numbers of hours reported for either midterm (t-test p-value: 0.29 for MT1, 0.39 for MT2).

Reported Study Times by Math 220 Grade Range:

The following graph shows the mean time reported for each midterm and the homework (Q4) for each grade interval (as for Q1). These show that (on average) students at the top and bottom of the grade range reported spending less time than those in the middle of the distribution. Our sample here is too small to say this difference is statistically significant, but it is in agreement with findings in other courses.

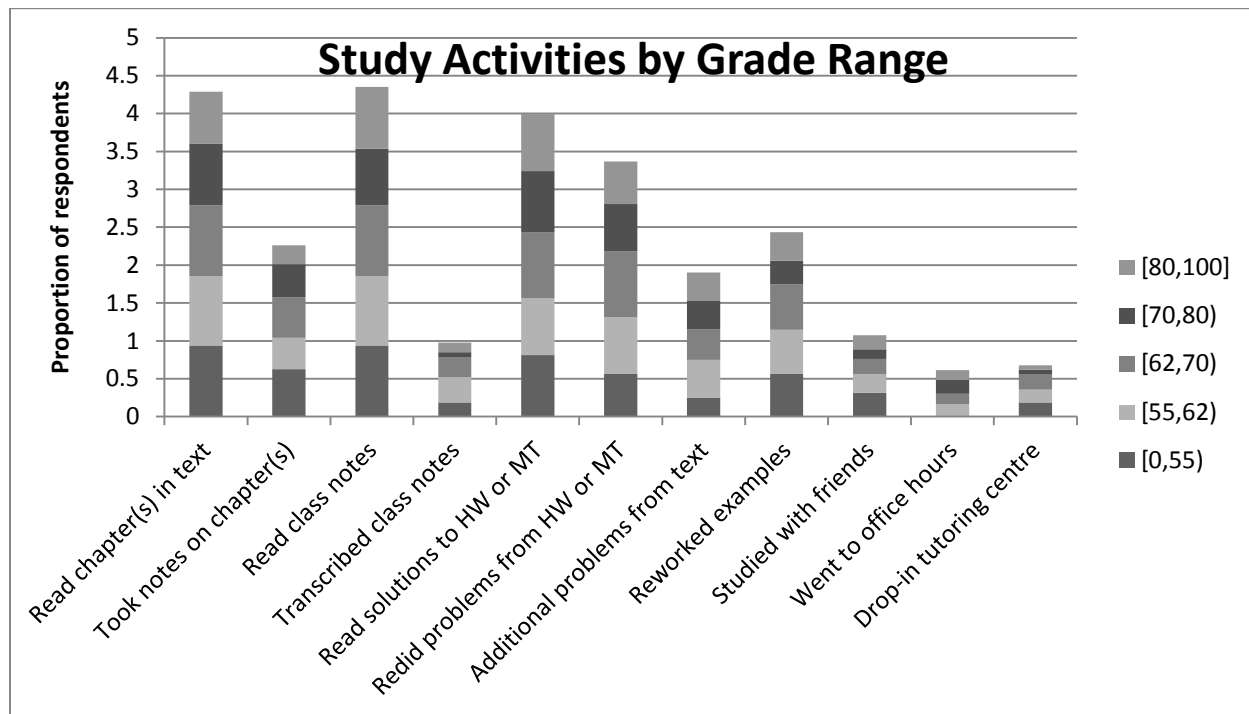


Q7: What did you do to study for this course? (check all that apply)

Response	2010 WT 1		2011 WT 2	
	Number of Responses	Proportion of Responses (%)	Number of Responses	Proportion of Responses (%)
Read chapter(s) in the textbook	70	81	66	86
Took notes on chapter (s)	31	36	35	45
Read class notes	76	88	66	86
Transcribed class notes into personal notes	11	13	14	18
Read solutions to the homework assignments or midterms	78	91	61	79
Redid problems from the homework assignments or midterms	54	63	50	65
Did additional problems from the textbook	28	33	30	39
Reworked examples from the textbook and/or class notes	33	38	37	48
Studied with friends	10	12	16	21
Went to office hours	13	15	9	12
Went to the drop-in tutoring centre	20	23	10	13
Worked with a private tutor	3	3	0	0
Other (please specify)	5	6	1	1

Comments: Most students in both terms read the textbook, class notes, and solutions to homework and midterms. However, less than half of students in each section report doing more active (and likely productive) studying such as reworking text or class problems, or doing additional problems from the text. For most items there was no statistical difference between terms.

Study Activities by Math 220 Grade Range:



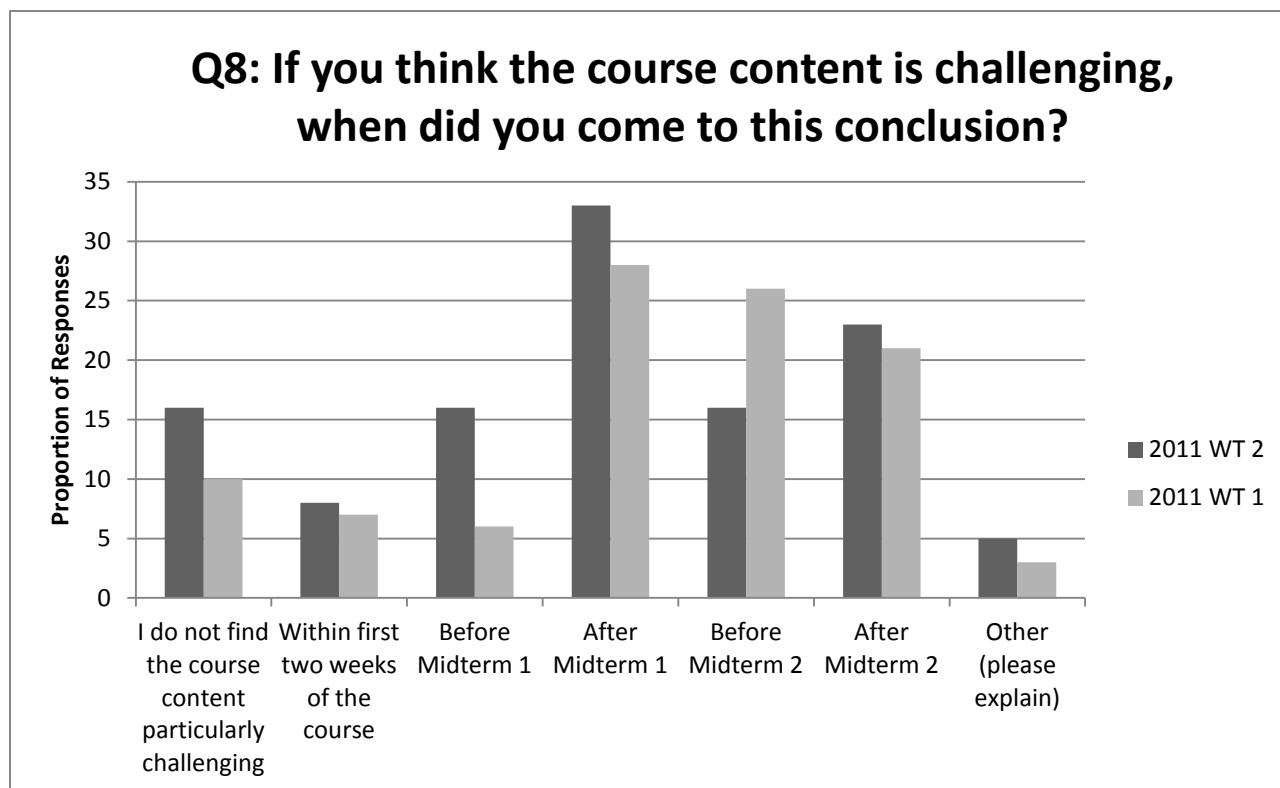
Comments: The study habits of students do not appear to vary significantly between the different grade ranges. One exception is that the lowest performing students, the [0,55] interval, did not attend office hours at all. These students seem to prefer to study with friends or go to the drop-in tutoring centre for help. Descriptively, high-performing students less frequently choose to take notes on chapters or transcribe class notes than do students in lower grade ranges.

Q8: If you think the course content is challenging, when did you come to this conclusion?

Note: when more than one box was checked I included only the earliest time in the data presented here.

Response	2011 WT 2		2011 WT 1	
	Number of Respondents	Proportion of Respondents (%)	Number of Respondents	Proportion of Respondents (%)
I do not find the course content particularly challenging	12	16	7	10
Within first two weeks of the course	6	8	5	7
Before Midterm 1	12	16	4	6

After Midterm 1	24	33	20	28
Before Midterm 2	12	16	19	26
After Midterm 2	17	23	15	21
Other (please explain) 2011WT1: -prior to starting the course -only for cardinality of sets	4	5	2	3



Comments: The time at which students first find the course challenging is distributed throughout the duration of the course, with a mode after midterm 1, and a second group that comes to this realization following midterm 2. It does not seem like there is a single topic responsible for students finding the course challenging. Descriptively, students with the lowest grades, the [0,55) interval find the course challenging earlier on than students who end up with high grades in Math 220.

Course Difficulty Timing by Math 220 Grade Range:

The proportion of responses to this question for each grade interval are shown in the figure below

