When Leibniz first arrived in Paris in 1672, he had little knowledge of mathematics beyond the simplest parts of Euclid and some fragmentary ideas from Cavalieri. He quickly became aware that in that age to be ignorant of mathematics was to be negligible in the eyes of most educated men, and he began his mathematical studies with the aim of establishing his credibility as a serious thinker. However, once started, he was irresistibly drawn to the subject. When he returned to Paris from London, he spent more and more of his time on higher geometry, under the general guidance of Huygens, and began the series of investigations that led over the next few years to his invention of the differential and integral calculus. In 1673 he made one of his most remarkable discoveries, the infinite series expansion

\[
\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} + \ldots
\]

This beautiful formula reveals a striking relation between the mysterious number \( \pi \) and the familiar sequence of all the odd numbers.

1. He was the first to perceive that the laws of thought are essentially algebraic in nature, and by this insight and his subsequent efforts he founded symbolic logic. He imagined a distant future when philosophical discussions would be carried on by means of logical symbolism and would reach conclusions as certain as those of mathematics. He expressed his vision as follows:

If controversies were to arise, there would be no more need of disputation between two philosophers than between two accountants. For it would suffice to take their pencils in their hands, to sit down to their slates, and to say to each other (with a friend as witness if they liked): Let us calculate.

Philosophy has not yet reached this stage, and perhaps it never will, but much of what Leibniz foresaw can be recognized in the computerized decision-making processes of modern business, government, and military strategy. During the 1670s and 1680s he made considerable progress on his project to deal with logic by algebraic methods. In modern terminology, he stated the main formal properties of logical addition, multiplication, and negation; he considered the empty set and set inclusion; and he pointed out the similarity between certain properties of set inclusion and the relation of implication for propositions. Though unfortunately most of this work was not published until two centuries later, it was the historical source of the symbolic logic (Boolean algebra) developed by George Boole in the nineteenth century and carried forward by Whitehead and Russell in the early part of the twentieth century. There is evidently little exaggeration in the judgment, “Leibniz deserves to be ranked among the greatest of logicians.”

The study of calculus is demanding. You will probably spend a minimum (there’s some calculus) of 9 hrs/week doing homework. Class will be devoted to lectures and problem solving.
Math 121 Calculus Part 1
Instructor: James V Frugale
Office: 609 Science Center
Tel: 6852183
Office Hours: M,W 12:30-1 pm, F 10:30-2 pm
Other times by appointment

Grading:

Attendance: Important if your grades are "not good"
Extra help: 1) TA's, Time to be set at a later date
2) Math workshop, Time to be set at a later date
Test dates will be on or close to the dates on the syllabus. NO MAKEUPS
Homework: Pass in all HW on time neatly done and stapled. The HW will equate to a test
when computing your final grade. Late HW will be penalized!
HW codes: 1) o= odd number examples
2) e= even number examples
3) eoo= every other odd number example (1,5,9,...)
Inform me about any special needs or circumstances that you may have ASAP by e-mail
or call X2183
Final exam will be comprehensive!
Calculators are not permitted during exams

Grade: Ave = \frac{\sum_{i=1}^{n} T_i + HWave + 2F}{7}

T_i = test grades
F = Final Exam
HWave = Homework average
Math 121/07/Spring Tentative Schedule

Sept 5th - w
1.2 \(1.77\) 1.3 \(1.55\)

Sept 7th - f
1.4 \(1.63\) 1.5 \(1.36\)

Sept 10th - m
1.6 \(1.63\) 2.1

Sept 12th - w
1.8 \(1.68\) 1.9

Sept 14th - f
2.2 \(1.47\) 2.2

Sept 17th - m
2.3 \(1.45\) 2.3

Sept 19th - w
2.4 \(1.45\) 2.4

Sept 21st - f
2.5 \(1.31\) 2.5

Sept 24th - m
2.6 \(1.25\) 2.6

\* Sept 26th - w
3.1 \(1.31\)

\* HW Due
4.2

\* Total 33

\* Total 38
Oct 1st - m

\{ Test Chapters 1 + 2 \}

Oct 3rd - w
\[ 3 \times \left( -3 \right) 0 \pm 3, 57, 42 \]

Oct 5th - f
\[ 3 \times \left( -7 \right) 0, 10, 13 \]

Oct 8th - m
\[ 3 \times \left( -35 \right) 0, 40, 43, 53, 58, 62, 66, 69 \]

Oct 10th - w
\[ 3 \times \left( -58 \right) 0, 00, 52, 59, 64, 63, 64, 71 \]

Oct 12th - f
\[ 3 \times \left( -39 \right) 8, 43, 44, 46, 49, 55, 57 \]

Oct 13, 14, 15, 16 - Break

Oct 17th - w
\[ \{ Test \} 0, 03 \times \left( -36 \right) \]
\[ 3 \times \left( 31, 31, 45, 53, 47 \right) \]
\[ 3 \times \left( 31, 43, 50, 66 \right) \]
\[ 3 \times \left( 9, 19, 29, 45, 53, 62 \right) \]

Oct 19th - f
\[ 4 \times \left( -35 \right) 0, 37, 38, 41, 43, 51, 55, 58 \]

Oct 22nd - m

\{ Test Chapter 3 \}

Oct 24th - w
\[ 4 \times \left( -31 \right) 0, 33, 35, 38, 43 \]

Oct 26th - f
\[ 4 \times \left( -21 \right) 0, 25, 28, 33, 34, 38, 44, 46 \]
Oct 29th-w

4.5  (1-7)0, 10, 11, 17, 18, 20, 32, 33, 43, 48, 53

Nov 2nd-f

4.7  (1-5, 9, 43, 44, 55)  4.6  (7, 15, 21, 32, 39, 48)

Nov 5th-m

4.8  (1-5, 4)00, 54, 56

Nov 7th-w

4.9  (1-9)00, (11-20) all, 21, 25, 29, 33, 35, 41, 44, 55

Nov 9th-f

4.10  (1-11)0, 14, 15, 22, 24, 34, 38, 42

Nov 12th-m

4.7  (1, 3, 6, 13, 25

Nov 14th-w

5.2  (1-4) all, 7, 17, 21, 23, 28

Nov 26th m

5.4  (1-47)6, 48, 50, 52, 55, 58, 61

Test Chapter 4

NOV 21, 22, 23, 24, 25—BREAK
Nov 28th-w  5.5  (1-3) 0

Nov 30th-f  5.6  (1-31) 0, 34, 35, 38, 44, 50

Dec 3rd-m  5.7  (1-43) 0

Dec 5th-w  5.7  (45-71) 0, 78, 76

Dec 7th-f  5.8  (1-11) all, 17, 24, 25

Dec 10th-m(last class)  5.7  (5, 17, 25, 29, 37, 45, 53, 61, 65)

5.8  (3, 5, 11, 24, 25)  5.9  (13, 35, 71, 17, 17)

Total 20