Math 108 Syllabus – Summer II 2006.

Text. Elementary Differential Equations and Boundary Value Problems by Boyce and DiPrima, 8th edition.
Publisher: John Wiley & Sons, Inc. (ISBN 0-471-43338-1)

Daily Coverage and Homework Assignments.

Lesson 1 Intro.
Section 2.1. #'s 1(abc),4(abc),14,20,28,33. Use Maple for #1(ab) and 4(ab).

Lesson 2 Section 2.2 #'s 1,3,7,13(ac),16(ac),21,31(a,b),34(a,b),36(a,b).
Begin Section 2.3.

Lesson 3 Finish 2.3. #'s 2,8,9,10.
Section 2.4. #'s 7,9,14.

Lesson 4 Section 2.6. #'s 1,5,7,11,12,18,21,25.

Lesson 5 Section 3.5. #s 23,28,33,38,39.
Section 3.7. #'s 3,5,8,15,18.

Lesson 6 **Test I –Monday July 10, in class**

Lesson 7 Section 6.1. #'s 2,3,5,6,9,26,27.
Section 6.2. #'s 1,2,3,8,9,13,14,16.

Lesson 8 Section 6.3. #'s 1,4,6,8,10,11,15,16,19,20,27,29,31.
Section 6.4. #'s 3,5,9,12.

Lesson 9 Section 6.5. #'s 1,4,9,12,13,17.
Begin Section 6.6.

Lesson 10 End Section 6.6. #'s 1,6,9,11,13,14
Review.

Lesson 11 **Test II –Monday July 17, in class**

Lesson 12 Section 10.1. #'s 2,3,7,14,17,20.

Lesson 13 Review of 107.
Begin Section 10.2.

Lesson 14 Section 10.2. #'s 4,6,8,9,16,18,29.
Section 10.3. #'s 2,4,13,14,15,17.

Lesson 15 Section 10.4. #'s 3,5,6,7,12,16,17,35,36.

Lesson 16 Derivation of Heat Equation.
Begin Section 10.5.

Lesson 17 Finish 10.5. #'s 3,4,5,7,11,12,22,
Section 10.6. #'s 2,8,11(a),12(a,b),15.

Lesson 18 Section 10.7. #'s 4,9,10.

Lesson 19 Section 10.8. #'s 2,7,8,10.

Lesson 20 Section 11.1. #'s 2,3,4,5,8,10,19.

Lesson 21 **Test III –Monday July 31, in class**

Lesson 22 Section 11.2. #'s 1,4,7,8,11,13,14,15,27.
Begin Section 11.3.

Lesson 23 Section 11.3. #'s 2,4,7,10,22
Review Power Series.

Lesson 24 Section 5.1. #'s 1,5,8,12,13,14,18,19,21,25.
Begin Section 5.2.

Lesson 25 Section 5.2. #'s 2,10,15,23.
Section 5.3. #'s 3,8,11,15,22.

Lesson 26 Section 5.4. #'s 5,6,12,19,20.

Lesson 27 Section 5.5. #'s 1,6,18,19,23,24.

Lesson 28 **Test IV –Wednesday August 9, in class**

Help Room:
The help room is located in Physics 299. Math 108's preferred tutor is **George Lam**. Tutors available daily from Monday July 3 until Friday August 11 according to the following schedule:

	M	T	W	Th	F
12-1pm	Gonzales	Cesa	Gonzales	Jenista	Jenista
1-2pm	**Lam**	Cesa	Gonzales	Cesa	Jenista
2-3pm	**Lam**	**Lam**	Gonzales	Cesa	Jenista
3-4pm	**Lam**	**Lam**	Gonzales	Cesa	Jenista

Grades:
Tests are worth up to 100 points each.
Homework is worth up to 60 points.

Warm-up Exercises

The following problems are not to be collected, but similar problems could be intermediate steps in the solutions of your homework problems, test problems or final exam problems.

________ (1) Complete the square of $2x^2 + x + 2$.

________ (2) Find all the values of the x in terms of union of intervals so that $|3x+1| \geq 4$.

________ (3) If $|f(x)| \leq 1$, $|g(x)| \leq 2$ for $x \in \mathbb{R}$, is $|3f(x) - 4g(x)| \leq 11$ on $\mathbb{R}$? Why?

________ (4) If $|f(x)| \leq 1$, $|g(x)| \leq 2$ and $|h(x)| \leq 3$ for $x \in \mathbb{R}$, is $|4f(x) + 5g(x) - 6h(x)| \leq 32$ on $\mathbb{R}$? Why?

________ (5) Solve for y from the equation $-\frac{1}{2}\ln|\frac{y}{x}+1| + \frac{1}{2}\ln|\frac{y}{x}-1| = \ln|x| + C$ where C is constant.

________ (6) Let $f(x) = 3x$ and $g(x) = \sin 2x$, compute $\int_0^t f(t-x)g(x)dx$ where $t \in \mathbb{R}$.

________ (7) Let $f(x) = |3x+1|$ and $g(x) = \sin 2x$, compute $\int_0^t f(t-x)g(x)dx$ where $t \in \mathbb{R}$.

________ (8) Compute $\int_0^\infty \frac{1}{(x^2+1)(x+1)}dx$.

________ (9) Find the antiderivatives $\int \frac{2x+3}{4-5x}dx$

________ (10) Compute $\int_0^2 (2x^3 - x + 1)\sin\frac{(2n-1)\pi x}{4}dx$ where $n = 0, 1, 2, \cdots$ and simplify your result as much as possible.

________ (11) Find A and θ so that $2\sin(3x) - 5\cos(3x) = A\cos(3x - \theta)$.

________ (12) Find the amplitude, angular frequency, phase angle and period of $y = 2\sin(3x) - 5\cos(3x)$.

________ (13) Differentiate $e^{x \sin x}$.

________ (14) Let $x = r\cos\theta$ and $y = r\sin\theta$. Rewrite $u_{rr} + \frac{1}{r}u_r + \frac{1}{r^2}u_{\theta\theta} = 0$ in terms of u_{xx} and u_{yy}.

________ (15) Simplify $\sum_{n=0}^\infty e^{-nx}$ and determine the natural domain of the function represented by the given series.

________ (16) Find the radius of convergence of $\sum_{n=1}^\infty \frac{(-1)^n n^2}{3^n}(x+2)^n$.

________ (17) Find the first five nonzero terms of the power series represented by $(\sum_{n=0}^\infty \frac{(-1)^n}{(2n)!}x^{2n})(\sum_{n=1}^\infty (-2)^{n-1}x^n)$.